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ABSTRACT

This paper, the final product of a study, "International Comparison of Teachers' Salaries," on an exploratory effort to compare salaries of elementary and secondary school teachers in the United States with those in other economically advanced countries. Data was obtained from Canada, Denmark, Federal Republic of Germany, France, Italy, Japan, Netherlands. New Zealand, South Korea, Sweden, and the United Kingdom. The report presents the following comparisons: (1) comparisons of average salaries, in which foreign salaries are converted to equivalent U.S. dollars using purchasing-power-parity exchange rates; (2) comparisons of relative pay, as represented by ratios of average salary to per capita gross domestic product and to the general wage level in nonagricultural employment; (3) comparisons of salaries at specified standard levels of seniority; and (4) comparisons of the length, steepness, and other attributes of salary-seniority scales. The report also recounts in some detail the procedures followed and problems encountered in seeking data from each country and attempts to derive some general lessons applicable to similar data collection efforts in the future. (JD)

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Survey Report **July 1988**

International Comparisons of Teachers' Salaries: An Exploratory Study

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NATIONAL CENTER FOR EDUCATION STATISTICS

Survey Report July 1988

International Comparisons of Teachers' Salaries: An Exploratory Study

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Office of Educational Research and Improvement CS 88-415

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NOTE: The name of the Center for Education Statistics (CES) has been changed to the National Center for Education Statistics (NCES). Because this report was written before the name was changed, all references are to the Center for Education Statistics or CES.

PREFACE

This paper is the second and final product of a study, "International Comparison of Teachers' Salaries," sponsored by the Center for Education Statistics of the U.S. Department of Education. It reports on an exploratory effort to assemble international data on teachers' salaries and to compare average teacher salaries and salary-seniority relationships between other countries and the United States. The earlier report produced under this study, A Comparison of Teachers' Salaries in Japan and the United States (Barro, 1986), offers an in-depth bilateral comparison, as contrasted with the broader but less detailed multilateral comparisons presented here.

The author is grateful to officials from twelve countries who responded to requests for information and to colleagues in the U.S. who provided advice and referrals to data sources. In particular, he wishes to thank the following individuals for special assistance: Dr. T. Gloudemans, of the Netherlands Ministry of Education and Science, for making available a valuable three-country comparative study of teachers; Mr. Shogo Ichikawa, of the National Institute for Educational Research in Tokyo, for providing and interpreting data for Japan; Mr. Yong-won Ryoo, education attache at the Embassy of the Republic of Korea, for providing special data compilations for this study; Mr. Brian J. Rusbridge, of the UK Local Authorities' Conditions of Service Advisory Board, for assembling a set of salary data for the UK; Prof. Robert Summers, University of Pennsylvania, for providing and interpreting purchasing-power-parity exchange rates; Mr. Jewell Gould, American Federation of Teachers, for supplying salary schedules for U.S. school districts; Prof. Stephen B. Lawton, of the Ontario Institute for Studies in Education, for providing several sets of international salary data; Dr. Joe Lee, formerly of Applied Systems Institute, Inc., for his assistance with the early data collection work and the interpretation of Japanese and Korean data; and Dr. Larry Suter, the Center for Education Statistics project officer for this study, for providing materials, referrals to data sources, and extensive advice on the study and its products. None of those named bears responsibility for how the data were interpreted and used or for the findings or conclusions of this report.

CONTENTS

Preface iii
List of Tables vi
Executive Summary vii

1. INTRODUCTION 1

Policy Relevance of International Salary Comparisons 1
Scope and Nature of the Inquiry 3
Data Collection and Data Problems 4
Limitations of Salary Comparisons 5
Organization of this Report 7

2. COMPARISONS OF AVERAGE SALARIES 9

Conversions of Foreign Salaries into Equivalent U.S. Dollars 9
Salary Comparisons Based on Individual-Country Data 12
Salaries Relative to General Economic and Wage Indicators ... 19
Salary Comparisons Based on Union Bank of Switzerland Data for Selected Major Cities 23
Salary Comparisons Based on UNESCO Data on Teacher "Emoluments" 27
Conclusions 30

3. RELATIONSHIPS BETWEEN SALARY AND SENIORITY 33

Data on Salary Schedules 33
Comparisons of Salary Scales (Individual-Country Data) 39
Comparisons Based on the WCOTP Data 46
Conclusions 49

4. DATA COLLECTION EXPERIENCES AND LESSONS LEARNED 51

Country-by-Country Summary 52
Data Collection in Japan 59
Data on Teachers' Salaries in the United States 60
General Observations and Lessons Learned 61

REFERENCES 64

APPENDIX: DATA ITEMS AND DATA SOURCES 65

LIST OF TABLES

Table 1. Purchasing power parity (PPP) and market exchange rates between selected national currencies and U.S. dollars, 1980-1984 13

Table 2. Average salaries of teachers in selected countries and comparisons with average salaries of teachers in the United States, 1980-1986 15

Table 3. Average salaries of teachers relative to per capita gross domestic product (GDP) and wages in nonagricultural occupations, selected countries and years 21

Table 4. Comparisons of average annual gross earnings of primary school teachers in major cities of selected countries, 1982 and 1985 24

Table 5. Teacher "emoluments" in selected countries and comparisons with average teachers' salaries in the United States (UNESCO data) 28

Table 6. Relative salary in relation to seniority, selected countries and categories of teachers 35

Table 7. Parameters of salary-seniority scales, selected countries and years 41

Table 8. Salaries at selected experience levels relative to starting salaries, selected countries and years 44

Table 9. WCOTP estimates of parameters of salary-seniority scales, selected countries, as of January 1, 1986 47

EXECUTIVE SUMMARY

This study was undertaken, first, to determine the feasibility of assembling usable international data on teachers' salaries, and second, to offer preliminary comparisons of teachers' salaries in other countries with those in the United States. It is an exploratory study in that the data collection activity was conducted with limited resources and confined to informal and low-intensity methods (i.e., no surveys, site visits, or government-to-government inquiries). It has revealed many problems both in obtaining data on different national education systems and in making valid intercountry comparisons. Nevertheless, the results do help to place the salaries of U.S. teachers in an international context and to illustrate the kinds of policy-relevant findings that are potentially derivable from such international-comparative research.

At least some usable data on average salaries, salary scales, or both were obtained for the following foreign countries: Canada, Denmark, Federal Republic of Germany, France, Italy, Japan, Netherlands, New Zealand, South Korea, Sweden, and the United Kingdom. There are large variations among these countries in data availability and data sources and in the completeness, quality, and reliability of the information obtained.

Comparing teacher salary figures across countries is problematical for multiple reasons. International differences in the structures of education systems, in the definitions of teacher categories, and in the make-up of teacher compensation raise doubts about data comparability. Differences in the composition of teaching forces with respect to age, training, etc. are difficult to distinguish from differences in levels of pay. Differences in workloads and other attributes of the teaching job should be considered when salaries are compared, but adequate data on these matters are lacking and appropriate adjustment methods have not been developed. Pending further work on these problems, the salary comparisons presented here (and any other such comparisons) should be treated as preliminary, tentative, and illustrative rather than definitive.

Subject to the foregoing cautions and qualifications, the report presents the following comparisons between teachers' salaries in other countries and salaries in the United States: (1) comparisons of average salaries, in which foreign salaries are converted to equivalent U.S. dollars using purchasing-power-parity (PPP) exchange rates, (2) comparisons of relative pay, as represented by ratios of average salary to per capita gross domestic product and to the general wage level in nonagricultural employment, (3) comparisons of salaries at specified standard levels of seniority, and (4) comparisons of the length, steepness, and other attributes of salary-seniority scales.

Among the principal findings from these comparisons are that:

- The average level of teacher pay, measured in terms of purchasing power parity, is lower in most other advanced countries than in the United States; however, salary levels in Japan are about equal to those in the U.S., and salary levels in Canada are significantly higher.

- Teachers in the United States are generally paid less relative to per capita gross domestic product (GDP) than are teachers in other advanced countries.

- The United States falls roughly in the mid-range of countries with respect to the degree to which salary varies with seniority, but U.S. salary schedules level off relatively early, whereas some other countries continue to reward seniority throughout the teaching career.

The report also recounts in some detail the procedures followed and problems encountered in seeking data from each country and attempts to derive some general lessons applicable to similar data collection efforts in the future. Among the latter are that indirect and long-distance data collection are unlikely to yield satisfactory or timely results; formal surveys are also unlikely to be unfruitful without provision for extensive direct communication with respondents; data interpretation and clarification should be recognized as distinct, resource-consuming activities; and finally, the preferred data-acquisition method is on-site interactive data collection, with ample provision for follow-up.

1. INTRODUCTION

This paper reports on an exploratory effort, undertaken for the National Center for Education Statistics (NCES), to compare the salaries of elementary and secondary school teachers in the United States with those in other economically advanced countries. It describes attempts to assemble international data on salaries and salary structures; discusses the problems of acquiring, interpreting, and comparing such data; presents the available salary figures and tentative comparisons between selected other countries and the U.S.; and offers suggestions about data collection and comparison strategies for the future.

The main reason for characterizing the effort as "exploratory" is that the scope and intensity of the data collection activity were limited. The intent from the start was to determine the feasibility of assembling a usable data base out of existing materials from individual countries and international organizations, mainly through informal inquiries and with relatively modest expenditures of time and resources.[1] More intensive or formal data collection methods, such as surveys, government-to-government inquiries, and site visits to national education or statistical agencies, were generally not employed.[2] Further, the even more intensive data collection and analytical work that would have been needed to allow nonsalary factors to be taken into account in comparing salaries was not undertaken. There was no attempt, for instance, to assemble comparative information on teacher qualifications, workloads, and non-salary compensation in different countries (nor--it is now clear--could such attempts have been pursued successfully within the bounds of the study). In sum, this should be construed as a report on a reconnaisance mission rather than a full-blown international comparative analysis.

Policy Relevance of International Salary Comparisons

Although this study was not a policy analysis, nor undertaken in support of one, it was motivated in part by the belief that international

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[1]An extant data set compiled by one international organization, the International Labor Office (ILO, 1982), provided some of the original impetus for this inquiry. The ILO data set includes, among other things, 1980 teacher salary ranges for many countries, and determining whether such information could be extended or updated was one of the questions initially of interest to CES.

[2]The principal exception to this limitation is that more intensive methods were used to collect data for Japan. These included visits to the Ministry of Education and the National Institute for Educational Research in Tokyo and substantial follow-up correspondence. The resulting data for Japan, which are more detailed and thorough than the other data contained in this paper, are presented in a separate report, A Comparison of Teachers' Salaries in the United States and Japan (Barro, 1986).

comparisons of teachers' salaries would respond to interests of U.S. policymakers. Such interests have recently been stimulated by education policy debates and the education reform, or "educational excellence," movement in the United States. In particular, indications that teaching is more effective or teachers are of higher quality in other countries seems to have made U.S. educators and policymakers more receptive to lessons from abroad.

One major theme of the recent education reform reports in the United States is that the quality of the U.S. teaching force is too low. Some of the reform task forces attribute this low quality, in part, to deficiencies of the U.S. teacher compensation system. The report of the National Commission on Excellence in Education (1983), as a prime example, indicates that many teachers are drawn from the lower-ability strata of college graduates and then goes on to recommend, based on a presumed connection between compensation and quality, that salaries "should be increased and should be professionally competitive, market-sensitive, and performance-based." Other bodies have issued similar recommendations for raising and restructuring teacher pay, and many states have acted on such recommendations, in some cases significantly realigning their salary systems. International comparisons of educational quality appear frequently in the reform literature. The relevance of such comparisons to the teacher quality/teacher compensation issue is demonstrated in the recent report of the Carnegie Forum on Education and the Economy (1986), which cites both the superior performance of Japanese students and the higher relative salaries of teachers in Japan in arguing for increased pay for teachers in the United States.

Another major current policy concern in the United States is that the future supply of teachers may be inadequate to meet future demand, or, putting it differently, that the lack of enough high-quality or well-qualified entrants will bring about a further decline in the caliber of the teaching force (see, e.g., Darling-Hammond, 1984). Here too, teacher compensation is a key consideration, since the number of qualified persons willing to enter and remain in teaching depends on how, and how well, teachers are paid. Other countries, such as Japan, apparently do not face the difficulties we do in attracting qualified applicants into the profession. It is conceivable, therefore, that information on other countries' pay scales (and other features of their systems that attract teachers) could provide valuable insights to policymakers in the United States.

In sum, international comparisons have the potential to contribute to U.S. policy debates by illuminating the relationships between teacher supply and teacher quality, on one hand, and teacher compensation, on the other. If it could be shown, for example, that countries with relatively high levels of teacher pay tend to attract higher-quality people into teaching (or that such countries do better in educating their children), that would encourage reliance on the teacher compensation system as a tool to address our teacher quality and teacher shortage problems. I hasten to point out, however, that this inquiry does not address such issues directly but is limited to collection and comparison of teacher

salary figures. Analyzing the relationships between international variations in salary and

international differences in quality or supply would be a separate (and much more ambitious) research endeavor.

Scope and Nature of The Inquiry

This study was intended to address both a substantive question and a process question. The substantive question is, "how does teachers' pay in the U.S. compare with teachers' pay in other advanced countries?" The process question is whether it is feasible, using informal methods and with limited resources, to assemble a respectable set of multinational data on teachers' salaries. Naturally, I have been able to pursue the substantive question of how salaries compare only to the limited degree to which the feasibility of data collection has been confirmed.

The coverage of this study has generally been limited to economically advanced countries and, within that group, to countries for which data could be obtained. Specifically, attempts were made initially to collect data from all the more developed Western European countries and from Japan, Canada, and Australia. Usable data were eventually obtained from the latter three and, among the Western European countries, from the United Kingdom, the Federal Republic of Germany, the Netherlands, Sweden, and Denmark and, to a considerably lesser degree, from Italy and France. In addition, data became available serendipitously for two countries for which data collection was not originally contemplated, New Zealand and South Korea, and both are included in the study. In total, then, this paper presents individual-country data from nine countries other than the United States. In addition, supplementary data from certain multinational data tabulations (to be described later) cover some of the countries named above plus several European countries not listed above.

Data unfortunately could not be obtained for the same school years for all countries. I attempted to obtain information for the 1983-84 school year, if possible, or otherwise for the most recent preceding year for which data were available. Data were also sought for other years from 1980 to the present, and in some cases multiyear data were acquired. In a very few cases, some data were obtained for school years commencing in 1984 or 1985.

The principal data items of interest in this study were (1) salary levels, or averages, and (2) salary scales, or schedules. In some cases, supplementary data were needed to construct the averages or schedules. For example, figures for some countries were disaggregated geographically (by state or province) or by certain attributes of teachers (e.g., age stratum), making it necessary to use data on numbers or distributions of teachers to construct the desired data items. Other types of data pertinent to the analysis include measures of general income and wage levels (to which teachers' salaries are compared) and appropriate conver-

sion factors for translating salaries from national currencies into "equivalent U.S. dollars." These items were obtained from publications of international organizations, including the Organization for Economic Cooperation and Development (OECD), the World Bank, and the International Monetary Fund (IMF). Originally, it was hoped that data could also be assembled on various characteristics of teachers, on conditions of teaching in each country (workloads, working conditions, etc.), and on nonsalary components of compensation, but this proved too large a task to accomplish within the limits of the study.

The principal intercountry comparisons made in this report are of the following variables:

1. Average salaries, expressed in units of U.S. dollar-equivalent purchasing power (explained later) for primary and secondary school teachers;

2. Ratios of salaries to per capita income and to general wage levels in nonagricultural employment in the respective countries;

3. Salaries paid to teachers at specified standard seniority levels, expressed both in units of equivalent purchasing power and as ratios to starting salaries; and

4. Descriptors of salary-seniority relationships, such as the rate at which salary increases with seniority and the ratio of the salary of the most senior teachers to the salary of starting teachers.

These by no means exhaust the comparisons worth making, but data limitations precluded a number of other potentially illuminating lines of inquiry.

Data Collection and Data Problems

Subject to the constraint that data collection methods were to be informal and nonresource-intensive, I pursued several different approaches to gathering information, as follows:

1. Extraction of data from statistical publications of individual countries or international agencies,

2. Collection of data through inquiries to national embassies or national information offices located in the United States,

3. Collection through inquiries to research institutions in individual countries or institutions engaged in international research or data collection,

4. Data acquisition through direct personal contacts and referrals.

Each approach proved more successful with some countries than with others, making it necessary to rely on different approaches, or cominations of approaches, in different cases. The resulting nonuniformity of method unfortunately detracts from the quality and international comparability of the salary data. Official, published salary figures were obtained for some countries, while only rougher data--sometimes nothing more than inadequately documented estimates--were available for others. Consequently, I have sometimes been unable to ascertain whether the salary figures for different countries pertain to comparable salary measures or comparable categories of teachers.

Even if it had not been necessary to resort to diverse data acquisition techniques, certain inherent problems of data comparability would have been unavoidable. Different countries have differently structured education systems. "Primary" and "secondary," for example, do not pertain to the same grade spans in all cases. Teaching forces are diversely constituted. While some countries' personnel systems resemble the system in the United States, other countries have multiple categories of teaching staff, some with no U.S. counterparts, making it unclear which groups' salaries can validly be compared. The make-up of teacher compensation also varies among countries. Some countries rely heavily on forms of cash compensation other than basic salary, including "bonuses" and elaborate systems of allowances. Some have fringe benefit packages not comparable in scope with fringe benefits in the United States. The roles of the public and private sectors in elementary and secondary schooling also vary from one country to another. These differences in systems and definitions would adversely affect data comparability even if a standard, well-controlled method of data collection could have been applied across the board.

More information on data collection and data quality is provided later in the report. The data collection effort and the lessons learned therefrom are discussed in Section 4; summaries by country of the available variables and the data sources are provided in an appendix.

Limitations of Salary Comparisons

International comparisons in general, and teacher salary comparisons in particular, are beset by many conceptual and technical difficulties other than those having to do with the quality of salary data. These difficulties arise mainly out of intercountry variations in the attributes of teaching forces, the make-up of teacher compensation packages, and the characteristics of the teaching job. Failing to take such variations into account could lead to misleading salary comparisons; yet the means of adjusting for such variations are not in hand. Data on the relevant nonsalary factors are generally unavailable. Moreover, having the data would not necessarily solve the problem, since it is unclear in some cases how, even in principle, adjustments should be made. It is especi-

ally important, therefore, to be aware, before inspecting salary figures, how inferences from such data may be rendered questionable by variations in nonsalary factors.

The teaching forces of different countries differ in composition with respect to training and qualifications, seniority or experience, sex, age, and perhaps other demographic factors. The significance of such differences is that observed intercountry differences in average pay may reflect differences in teacher characteristics as well as differences in salary levels or structures. An apparent difference in average salary between countries could be due, for example, to a higher average level of teacher seniority in one country than in the other. In principle, it should be possible either to adjust for such differences or to circumvent the problem by comparing salaries paid to teachers with standard characteristics. I have been able to do the latter, to some extent, with respect to teaching experience; but I have not had the data to adjust for other types of differences in the compositions of different countries' teaching forces.

Countries also differ, as already noted, in the mix of salary, salary supplements, and nonsalary items that make up the teacher compensation package. Where the ratio of salary to total compensation varies from one country to another, comparisons of salaries alone will give incorrect impressions of relative levels of total rewards. In principle, these distortions could be avoided by converting the nonsalary elements of compensation into salary equivalents and then comparing total compensation per teacher, but the data requirements for doing this are immense (especially with respect to such complex nonsalary items as teacher pensions) and the task has not been attempted in this study.

Perhaps the most difficult nonsalary factors to deal with, even in principle, are intercountry variations in the nature of the teaching job. These include variations in the duration of the school day and school year; in numbers of instructional hours, class loads, and teacher-pupil ratios; in the range of a teacher's duties and the scope of his or her responsibilities; in the availability of support staff and other supporting resources; and, less tangibly, in the strenuousness of teaching assignments in terms of such things as students' educational needs and the difficulty of maintaining classroom order. The worse the conditions facing the teacher, the more a teacher presumably has to be paid to end up with equivalent net rewards, but how one adjusts for the various job characteristics has yet to be established.[3] In other words, even with

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[3]In theory, one could compute the appropriate salary adjustments from a teacher supply function--i.e., a mathematical relationship between the salary for which a teacher is willing to work and the various factors that affect the attractiveness of the teaching job, including workload, class size, pupil characteristics, etc. Given such a function, one could estimate the "compensating differential" in salary needed to offset the advantages and disadvantages created by working conditions that differ from the international norm. In practice, it is difficult to develop valid supply

ideal data, it would still be difficult to take differences in working conditions and other job characteristics into account in making salary comparisons.

In this paper, as I have already indicated, salaries have not been adjusted to reflect the nonsalary factors listed above (except that some salary comparisons are offered for teachers with standard levels of experience). All salary figures and all comparisons between foreign and U.S. salary levels should be understood and interpreted accordingly.

Organization of this Report

In the remainder of this report, I first present salaries and salary comparisons and then a more detailed description of data collection problems and procedures. Section 2 presents the available data on average teachers' salaries and offers international comparisons of (a) dollar-equivalent salaries and (b) ratios of salaries to per capita income and general levels of wages. Section 3 presents and compares salary-seniority profiles. Section 4, as already noted, describes the data collection process and draws lessons from it for future data collection efforts. The appendix contains country-by-country descriptions of the data items presented in the tables and the data sources.

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functions even for comparisons among relatively homogeneous areas or jurisdictions, e.g., school districts in a single state in the United States, much less for comparisons across countries.

2. COMPARISONS OF AVERAGE SALARIES

This section presents data on average teachers' salaries in selected foreign countries and salary comparisons between those countries and the United States. The primary data used in these comparisons are salary figures obtained from individual-country sources. These figures vary greatly in coverage and quality from one country to another, as is explained below. In addition, supplementary comparisons based on two multinational data sets are presented. One set, produced by the Union Bank of Switzerland, contains estimates of average salaries of primary teachers in selected major cities around the world. The second set, derived from UNESCO data, provides estimates of "emoluments" per teacher in selected countries. These two data sets, though presumably created for the purpose of supporting international comparisons, have problems of data quality and comparability fully as serious as those of the individual-country data, as will be brought out in the text. Before presenting the teacher salary figures, however, I address an issue logically antecedent to salary comparisons: that of converting salary data from one national currency to another, so that intercountry comparisons can be made.

Conversions of Foreign Salaries into Equivalent U.S. Dollars

Since the purpose of this inquiry is to compare teachers' pay in other countries with teachers' pay in the United States, a method is needed for converting non-U.S. salaries into "equivalent" U.S. dollars. There is more than one way to define the dollar equivalent of a foreign teacher's salary, but for the purpose of this analysis I define it in terms of the teacher's purchasing power, or ability to consume.[1] The dollar equivalents of salaries denominated in British pounds, German marks, or Japanese yen are, by this definition, the numbers of dollars that would be required in the United States to support the levels of consumption enjoyed by the salary earners in Britain, Germany, and Japan, respectively. But that still leaves open the question, what salary conversion factors shall be used?

The conventional answer--"use market exchange rates"--is straightforward but incorrect for the purpose at hand. Converting all salaries into dollars at market exchange rates does not yield valid estimates of salary-earners' purchasing power in other countries. There are two principal reasons why it does not. First, the commercial, or market, exchange rates reflect directly only the relative prices of goods traded

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[1]One alternative is to define the dollar equivalent of a foreign salary as the number of dollars required to buy equivalent teacher services, or an equivalent "amount of teaching." This might be the appropriate concept to use, say, in an international comparison of educational productivity. However, the difficulties of implementing such a concept are immense (knowledge of the determinants of teachers' productivity in each country would be required), and I cannot deal with them in this study.

internationally, which do not include many important items in the market basket of the typical teacher or consumer (e.g., housing, local transportation, and most personal services). Second, market exchange rates are strongly affected by factors other than the relative purchasing power of the respective national currencies. These factors include interest rates, stability of financial conditions, foreign trade balances, and economic trends and expectations in each country.[2] Consequently, comparisons based on market rates can yield distorted and misleading estimates of the relative rewards to teaching in different countries.

To illustrate, the market exchange rate between French francs and U.S. dollars averaged 8.7 francs per dollar in 1984 (OECD, 1987), while the estimated number of francs required to provide the same consumption purchasing power as one U.S. dollar in that year was only 6.4 (see the discussion of purchasing power parity rates, below). The dollar was then "overvalued" relative to its purchasing power in francs by about 36 percent, primarily because of such things as higher real interest rates in the United States. Consequently, a French teacher with a salary of, say, 80,000 francs per year would appear to be earning only about U.S. $9,200 at the market exchange rate, whereas that salary would actually support a level of consumption equivalent to approximately U.S. $12,500. In fact, during the years 1983 and 1984, to which most of my salary data pertain, the U.S. dollar was overvalued (in the sense referred to above) not only relative to French francs but also relative to the currencies of most other developed countries; hence, using the market exchange rates of those years would substantially understate the dollar-equivalent values of the other countries' levels of teacher pay.

The shortcomings of market exchange rates become most glaringly apparent when such rates are used to compare salaries between countries at different points in time. Consider teachers' salaries in the United States and Japan. In mid-1985, the market exchange rate between the two countries' currencies was about 250 yen per dollar. The average U.S. teacher's salary was about $23,500, while the average Japanese teacher's salary was about ¥5,000,000. The latter, at the 250 yen per dollar rate, translated into U.S. $20,000, or about 85 percent of the U.S. salary level. By early 1987, however, the value of the dollar had fallen so sharply that a dollar bought only 140 yen. Had nominal salaries in each country remained the same, the average Japanese salary, ¥5,000,000, would have translated, at the 1987 market rate, into U.S. $35,700--a seemingly miraculous gain of 78 percent in Japanese salaries relative to American salaries in less than two years. But of course, no such change in the relative purchasing power of Japanese and U.S. teachers actually occurred. Between 1985 and 1987, rates of salary growth and inflation have been roughly comparable in the two countries (if anything, a sharp rise in teachers' salaries in the U.S. has probably increased the relative real pay of American teachers). The apparent

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[2]For thorough discussions of the shortcomings of market exchange rates for making international income or consumption comparisons, see the review articles of Kravis (1984) and Marris (1984).

radical improvement in the relative position of Japanese teachers is wholly illusory--an artifact of exchange rate fluctuations unrelated to changes in the domestic purchasing power of either country's salaries. Which U.S.-Japan comparison is valid--that for 1985 or the radically different one for 1987? The answer is neither. Both are based on yen-to-dollar conversion factors that fail to reflect the relative purchasing powers of the respective currencies. That calculations based on different year's market exchange rates yield wildly inconsistent results is sufficient reason to avoid them in comparing salaries between countries.

Valid comparisons require conversion factors that reflect the domestic purchasing power of each national currency. That is, the appropriate factor is the ratio of the cost of a given market basket of goods in a foreign currency to the cost of the same market basket in U.S. dollars. Fortunately, such conversion factors exist. They are known as purchasing power parity (PPP) rates to distinguish them from the more familiar market rates. Estimates of PPP rates have been produced over the years by the United Nations International Comparison Project (ICP), based at the University of Pennsylvania, and more recently by the Organization for Economic Cooperation and Development (OECD). They are used regularly for making international comparisons by OECD, the European Economic Community (EEC), and the U.S. Bureau of Labor Statistics (BLS), and I use them here for these comparisons of teachers' salaries. More specifically, I use consumption PPP rates, which measure the relative costs of standard consumer market baskets in different countries. (There are also PPP rates for gross domestic product (GDP), but these reflect relative prices of investment goods and other items that do not enter into the teacher's or consumer's market basket.)

PPP exchange rates are constructed by measuring the prices of many individual goods and services in each country and then computing appropriately weighted sums of the individual relative prices. A massive data collection effort is required to accomplish this task. The final PPP figures produced by the ICP, for example, were based on prices of more than 500 individual goods and services (Kravis, Heston, and Summers, 1982).[3] The computational task is also formidable, involving the solution of a large system of simultaneous equations to obtain PPP rates for each country and "average world prices" for each good or service (Kravis, 1984; Ward, 1985). The most recent "benchmark" year for which detailed price data have been published is 1980; however, data for 1985 are to be issued shortly by OECD. PPP rates for intervening years have been calculated by extrapolation, taking into account rates of inflation, by product category, in each country. The PPP rates used in this report,

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[3]Moreover, some of the prices entering into the PPP calculations are not directly observable prices of homogeneous commodities but rather constructed prices of such complex items as housing, medical care, and government services. Dealing with each of these "comparison-resistant" services is a major undertaking in its own right, involving the use of econometric models to adjust for multiple dimensions of service quality (Kravis, 1984).

for the years 1980 through 1984, were provided by Prof. Robert Summers, one of the principal developers of the PPP measurement methodology. Full explanations of the PPP methodology are given in Kravis, Heston, and Summers (1982) and Ward (1985). A summary, together with recent results, is given in Hill (1984).

Table 1 presents consumption PPP exchange rates between selected national currencies and U.S. dollars for 1980-1984 and, for comparison, market exchange rates for the same years. The two rates differ by varying amounts, depending on the country and year. In 1984, for instance, French francs, British pounds, and German Deutschmarks had 36, 39, and 23 percent more purchasing power, respectively, compared with U.S. dollars than one would have inferred from the market exchange rates. In 1980, on the other hand, the same three currencies had 21, 12, and 25 percent less purchasing power, relative to U.S. dollars, than indicated by the market rates. Thus, using the market rates to compare teachers' salaries would have exaggerated the relative purchasing power of foreign teachers in some years and understated it in others. To avoid such distortions, I have used purchasing power rates for all intercountry salary comparisons.

Salary Comparisons Based on Individual-Country Data

As indicated earlier, I attempted to obtain data on average teacher salaries from diverse individual-country sources. Depending on the country, these included education ministries, national statistics bureaus, teacher unions, embassy personnel, and individual scholars. The results can be characterized as uneven and sometimes disappointing. For a few countries, detailed and seemingly reliable data were acquired; for a larger number, only fragmentary data and sometimes only estimates were obtained; and for other countries, no average salary data at all could be collected. Thus, the following comparisons are highly selective with respect to countries, years, and levels of education covered, and some of the salary figures are of dubious reliability.

More specifically, the following are country-by-country characterizations of the available average salary data, displayed in Table 2:

- The average salaries for Canada and Japan are derived from detailed official statistics, compiled and published annually. They are believed to be highly reliable and are available for multiple years.

- The figures for the United Kingdom were prepared by the UK Ministry of Education and Science. Some were extracted from an official statistical report, while others were supplied by an official of an association representing local public agencies.

- The average salary figures for the Federal Republic of Germany, and the Netherlands are from a three-

Table 1

PURCHASING POWER PARITY (PPP) AND MARKET EXCHANGE RATES BETWEEN SELECTED NATIONAL CURRENCIES AND U.S. DOLLARS, 1980-84

Country	Calendar Year 1980	1981	1982	1983	1984
			*** PPP RATES ***		
United States	1.00	1.00	1.00	1.00	1.00
Canada	1.07	1.10	1.15	1.17	1.18
Australia	0.99	0.99	1.04	1.10	1.14
New Zealand	NA	NA	NA	NA	NA
United Kingdom	0.49	0.51	0.52	0.53	0.54
Germany	2.42	2.36	2.34	2.32	2.31
Netherlands	2.41	2.36	2.36	2.33	NA
Sweden	5.76	5.90	6.14	6.55	6.89
Belgium	36.48	36.42	36.97	38.16	NA
France	5.36	5.57	5.84	6.18	6.42
Denmark	7.90	8.15	8.54	8.83	NA
Japan	247.98	239.08	231.84	227.23	224.81
South Korea	347.00	380.98	382.96	378.33	NA
			*** MARKET RATES ***		
United States	1.00	1.00	1.00	1.00	1.00
Canada	1.17	1.20	1.23	1.23	1.30
Australia	0.88	0.87	0.99	1.11	1.14
New Zealand	1.027	1.153	1.333	1.497	1.764
United Kingdom	0.43	0.50	0.57	0.66	0.75
Germany (Fed. Rep.)	1.82	2.26	2.43	2.55	2.85
Netherlands	1.99	2.50	2.67	2.85	3.21
Sweden	4.23	5.06	6.28	7.67	8.27
Belgium	29.24	37.13	45.69	51.13	57.78
France	4.23	5.44	6.57	7.62	8.74
Denmark	5.64	7.12	8.33	9.15	10.36
Japan	226.74	220.54	249.08	237.51	237.52
South Korea	607.43	681.03	731.08	775.75	805.98

Sources: PPP rates computed by Prof. Robert Summers from OECD data; market exchange rates from OECD, National Accounts: Main Aggregates, Vol. I, 1960-1985, Paris, 1987, and from statistics of the International Monetary Fund.

country comparative study sponsored by the Netherlands Ministry of Education and Science. They are one-time estimates, based on scheduled salaries for teachers with average characteristics and may be subject to substantial error.

- The figures for Sweden and Denmark were supplied by the respective education ministries in response to inquiries to embassies. I have no information about the underlying data from which they were derived, and no basis for judging their reliability.

- The average salaries for South Korea were supplied by that country's education ministry in response to an inquiry through the embassy. They are derived from detailed official statistics collected and compiled annually; however, salary averages had to be specially calculated by applying scheduled salaries to the distribution of teachers on the salary scale.

- Figures for New Zealand were provided by an official of the education ministry in response to an informal inquiry. The original data source is unknown.

- No average salary data were obtained directly from France, Italy, Belgium, and Australia, notwithstanding multiple inquiries to possible sources. However, some data for these countries were obtained from international compilations and are reported later in this section.

- Finally, the figures for the United States, reflecting the lack of official national data, are those compiled and published annually by the U.S. National Education Association (NEA).

Table 2 provides three pieces of information for each country, each school year, and each level of education (primary, secondary, etc.) for which average salary data are available: the average salary expressed in national currency, the average salary in equivalent dollars (converted at PPP rates), and the ratio of the dollar-equivalent salary to the salary paid in the same year to teachers at the same level in the United States. Subject to the numerous reservations expressed in the Introduction, these ratios provide direct comparisons of the relative consumption purchasing power, or attainable standards of living, represented by the salaries paid to U.S. and foreign teachers.

Given the limited coverage of Table 2, it is difficult to generalize about how U.S. teachers' salaries compare with those in other advanced countries, but nevertheless there are a number of interesting bilateral comparisons. It should be kept in mind throughout that these are comparisons of gross salaries only and do not take into account other forms

Table 2

AVERAGE SALARIES OF TEACHERS IN SELECTED COUNTRIES AND COMPARISONS WITH AVERAGE SALARIES OF TEACHERS IN THE UNITED STATES, 1980-1986

Country and Currency Unit	Level of Education	Year	Average Salary: National Currency	Average Salary: U.S. Dollar Equivalent (PPP Rate)	Avg. Salary/ U.S. Average Salary in Same Year[b]
United States (dollar)	Elementary	1980	15,570	15,570	1.00
		1981	17,241	17,241	1.00
		1982	18,801	18,801	1.00
		1983	20,205	20,205	1.00
		1984	21,452	21,452	1.00
	Secondary	1980	16,460	16,460	1.00
		1981	18,125	18,125	1.00
		1982	19,851	19,851	1.00
		1983	21,380	21,380	1.00
		1984	22,667	22,667	1.00
	Elem + Sec combined	1980	15,971	15,971	1.00
		1981	17,642	17,642	1.00
		1982	19,270	19,270	1.00
		1983	20,715	20,715	1.00
		1984	22,019	22,019	1.00
Canada (dollar)	Elementary	1981	23,574	21,470	1.25 e
		1982	27,019	23,515	1.25 e
		1983	30,756	26,220	1.30 e
		1984	33,583	28,364	1.32 e
	Secondary	1981	27,254	24,821	1.37 s
		1982	31,814	27,688	1.39 s
		1983	34,974	29,816	1.39 s
		1984	37,836	31,956	1.41 s
	Elem + Sec combined	1980	22,468	21,018	1.32 c
		1981	24,877	22,657	1.28 c
		1982	28,776	25,044	1.30 c
		1983	32,268	27,509	1.33 c
		1984	35,126	29,667	1.35 c
United Kingdom (pound)	Primary	1982	8,090	15,648	0.83 e
		1984	9,158	16,959	0.79 e
	Secondary	1982	8,467	16,377	0.83 s
		1984	9,575	17,731	0.78 s

Table 2 (continued)

AVERAGE SALARIES OF TEACHERS IN SELECTED COUNTRIES AND COMPARISONS WITH AVERAGE SALARIES OF TEACHERS IN THE UNITED STATES, 1980-1986

Country and Currency Unit	Level of Education	Year	Average Salary		Avg. Salary/ U.S. Average Salary in Same Year[b]
			National Currency	U.S. Dollar Equivalent (PPP Rate)	
United Kingdom (pound)	Prim + Sec combined	1980	6,086	12,420	0.78 c
		1981	7,636	14,973	0.85 c
		1982	8,303	16,060	0.83 c
		1983	8,890	16,774	0.81 c
		1984	9,401	17,409	0.79 c
Federal Rep. of Germany (mark)	Primary	1982	44,540	19,026	1.01 e
	Secondary	1982	50,756	21,681	1.09 s
Netherlands (guilder)	Primary	1982	39,718	16,858	0.90 e
	Secondary	1982	60,061	25,493	1.28 s
Sweden (crown)	Junior	1980	85,356	14,829	0.95 e
		1984	108,504	15,759	0.73 e
	Intermediate	1980	90,600	15,740	1.01 e
		1984	110,892	16,106	0.75 e
	Upper + Gymnasium	1980	107,988	18,761	1.14 s
		1984	129,456	18,803	0.83 s
Denmark (kroner)	Primary + Lower Sec.	1982	151,200	17,709	0.94 e
	Upper Sec.	1982	217,700	25,498	1.28 s
Japan (1,000 yen)	Elementary + Lower Sec.	1980	4,024	16,227	1.04 e
		1981	4,151	17,362	1.01 e
		1982	4,317	18,621	0.99 e
		1983	4,447	19,570	0.97 e
		1984	4,577	20,359	0.95 e
	Upper Secondary	1980	4,278	17,251	1.05 s
		1981	4,442	18,580	1.03 s
		1982	4,671	20,148	1.01 s
		1983	4,867	21,419	1.00 s
		1984	5,037	22,406	0.99 s

Table 2 (continued)

AVERAGE SALARIES OF TEACHERS IN SELECTED COUNTRIES AND COMPARISONS WITH AVERAGE SALARIES OF TEACHERS IN THE UNITED STATES, 1980-1986

Country and Currency Unit	Level of Education	Year	Average Salary		Avg. Salary/ U.S. Average Salary in Same Year[b]
			National Currency	Dollar Equivalent (PPP Rate)	
Japan (1,000 yen)	Elem + Sec combined	1980	4,087	16,481	1.03 c
		1981	4,223	17,664	1.00 c
		1982	4,405	19,000	0.99 c
		1983	4,551	20,028	0.97 c
		1984	4,695	20,884	0.95 c
South Korea (1,000 won)	Primary	1984	5,650	14,947	0.70 e
	Middle	1984	5,230	13,836	0.64 e
	Senior HS	1984	5,650	14,947	0.66 s
New Zealand (dollar)	Primary	1986	27,560	16,212[a]	0.65 b
	Secondary	1986	34,650	20,382[a]	0.78 b

Sources: See the Appendix for sources of average salary figures for each country.

Note: The letters e, s, and c in the last column indicate that the base of the salary comparison is the U.S. salary (for the same year) paid to elementary teachers, secondary teachers, or elementary and secondary teachers combined, respectively.

[a]PPP rates not available for New Zealand. Conversion is at a market rate of 1.7 NZ dollars per U.S. dollar.

[b]New Zealand salaries for primary and secondary teachers in 1986 are compared with the estimated average U.S. salaries of $24,762 and $26,080 for elementary and secondary teachers, respectively, as reported in the 1985-86 edition of the NEA's Estimates of School Statistics.

of compensation, differences in hours and working conditions, or the other nonsalary factors mentioned in the Introduction.

The average salaries of Canadian teachers are strikingly higher than average salaries in the U.S., and the relative advantage of the Canadians increased over the five-year period for which data are available. As of 1984, a Canadian teacher could support a 35-percent higher level of consumption than his or her U.S. counterpart.[4] The U.S.-Canadian salary differences are somewhat larger when PPP rates rather than market exchange rates are used to convert Canadian salaries into equivalent U.S. dollars (a Canadian dollar had higher purchasing power in 1980-84 than its market exchange rate suggests), but would still be substantial even if ordinary exchange rates were used. The salary advantage enjoyed by Canadian teachers relative to U.S. teachers has recently been corroborated in a study by Lawton (1986). In fact, taking into account all the available data (i.e., data from multinational tabulations and from the Lawton study as well as the data in Table 2), it appears that Canadian teachers must be among the highest paid in the world.

Teachers' salary comparisons between Japan and the U.S. have been presented in detail in a previously published report of this CES-sponsored study (Barro, 1986). The data shown here for Japan constitute only a small fraction of the data presented in that document. The Japan entries in Table 2 show that the average salaries of Japanese teachers were essentially equal, as of 1984, in terms of consumption purchasing power, to those of U.S. teachers and that this equality reflects a decline from somewhat higher levels of relative pay in Japan in the recent past. Of course, if one were to compare salaries today (mid-1987) using market exchange rates, it would appear that the average Japanese teacher is paid close to U.S. $40,000, which is far above the U.S., or even the Canadian, level. But as explained in the foregoing discussion of exchange rates, such a calculation would greatly exaggerate the relative purchasing power of the average teacher's salary in Japan.

The figures on average teachers' salaries in Germany, the Netherlands, and Denmark bring out a characteristic of European salary structures that distinguishes them from the American system: there is much greater differentiation in Europe than in the U.S. between salaries of primary and secondary teachers. Thus, primary teachers in these three countries were paid at or somewhat below the levels of U.S. primary teachers in 1982, whereas secondary teachers in the same countries were better rewarded than their U.S. counterparts. The Swedish data for 1980 conform to the same pattern, but the 1984 Swedish data place Swedish salaries much below U.S. levels and show less salary differentiation by level of education. I have not been able to determine whether there is some problem or inconsistency in the data or whether some important structural change took place in the Swedish system between these two years.

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[4]Note, however, that the Canadian figures do not cover teachers in Quebec, which did not report salary data to Statistics Canada.

Salaries in the United Kingdom (England and Wales) in the period 1980-84 were lower relative to U.S. levels than salaries in the other European countries represented in Table 2. Also, the salary differential between elementary and secondary teachers in the UK, unlike the differentials in the other European countries, was smaller than that in the U.S. Evidence in subsequent tables confirms the low purchasing power of British teachers relative to their European peers.

The New Zealand entries in Table 2 are not comparable to the other entries because they are for a later year (1985-86) and because PPP rates are not available to convert New Zealand dollars into equivalent U.S. dollars. If New Zealand follows the Australian pattern, which is one of only small deviations between market and PPP rates (see Table 1), the application of market rates rather than PPP rates to New Zealand salaries should not substantially distort the comparison between that country and the United States. This comparison shows the purchasing power of New Zealand teachers at two-thirds to three-quarters that of their American counterparts (for primary and secondary teachers, respectively).

Finally, the dollar-equivalent salaries shown for South Korea in Table 2 seem remarkably high, considering the relatively low level of economic development in Korea compared with the other countries represented in the table. One reason for the seemingly high figures is that the use of PPP rates roughly doubles the U.S. dollar-equivalent value of the Korean salaries, as compared with a conversion at market rates. Even so, the Korean figures, if accurate, indicate that teachers in South Korea enjoy far greater economic rewards, relative to their non-teaching countrymen, than do teachers in any other country for which I have data.

Salaries Relative to General Economic and Wage Indicators

Although international comparisons of absolute salaries are of interest, comparisons of relative salaries are more indicative of teachers' economic status in each country and of the economic attractiveness of teaching as a profession. What probably counts most, especially as a determinant of teacher supply, is how teachers' salaries compare with earnings in other occupations and with general levels of per capita income in the national economy. I turn next, therefore, to intercountry comparisons of <u>ratios</u> of teachers' salaries to selected economic and earnings indicators.

There are a number of general economic indicators to which teachers' salaries might reasonably be compared. In my more detailed analysis of salaries in the U.S. and Japan, (Barro, 1986), I considered three such indicators--per capita gross domestic product (GDP), per capita national income, and per capita consumption. In this instance, because the salary data are too unreliable to support fine distinctions and because of limited availability of data, I confine myself to a single comparison--that between average teacher salary and per capita GDP.

The possibilities for comparing teachers' salaries with earnings in other occupations are limited. Internationally comparable salary or earnings data for specific occupations are generally not available. The only data suitable for the purpose at hand appear to be two broad wage indicators compiled and published annually by the ILO--the average wage in manufacturing and the average wage in nonagricultural occupations. Because the latter seems more appropriate for a comparison with teachers' salaries than a wage statistic limited to manufacturing, I have chosen it for this analysis.

It should be noted that there are a number of problems with the ILO wage data. One problem is limited availability: the wage in nonagricultural occupations is not reported by several of the countries covered by this study. A technical problem is that the wage data for some countries are expressed as hourly wage rates. It is unclear how these should be converted to annual wage figures comparable with the annual teacher salaries. Not knowing the actual numbers of work hours per year, I have simply multiplied the hourly wage by 8 hours per day and 260 days per year; but this is certainly not correct for all countries and probably results in some overstatement of annual pay in nonagricultural occupations. Another technical problem is that all countries reporting to ILO may not define wages in the same way. In particular, it is unclear whether wage supplements, such as bonuses and allowances, are included or, more generally, whether definitions of wages are uniformly comprehensive. There is also a more general conceptual problem that pertains to any broad wage index: the mix of occupations to which the index applies--in this case, "nonagricultural" occupations--may vary greatly from one country to another. Thus, intercountry differences in the ratio of average teacher' salary to the nonagricultual wage may reflect differences in the mix of nonteaching occupations rather than differences in the relative economic status of teachers. These problems notwithstanding, I have used the ILO wage figures because nothing more suitable is available. The reader is duly cautioned that the resulting comparisons are crude and not to be taken as more than illustrative.

Table 3 displays average teacher salary, per capita GDP, the average nonagricultural wage, as reported by ILO, and the ratios of teacher salary to the GDP and wage variables. Ratios are computed separately for teachers at different levels and for all teachers combined, where available. The teacher salary data are extracted from Table 2 and are for the most recent year for which data are available for each country.

The comparison of teachers' salaries with per capita GDP shows that U.S. teachers are paid less relative to GDP than teachers in all the included countries but Sweden. Moreover, the Swedish data for 1984 are of questionable validity, as already mentioned; a comparison using the 1980 Swedish data from Table 2 brings that country's ratio into line with the other non-U.S. figures shown in the table. It appears, therefore, that teachers in the United States are able to claim smaller shares of national income and output than are teachers in other advanced countries. While absolute levels of teacher pay in the U.S. are high

Table 3

AVERAGE SALARIES OF TEACHERS RELATIVE TO PER CAPITA GROSS DOMESTIC PRODUCT (GDP) AND WAGES IN NONAGRICULTURAL OCCUPATIONS, SELECTED COUNTRIES AND YEARS

Country and Currency Unit	Level of Education	Year	Average Teacher Salary	Per Capita Gross Domestic Product	Average Wage in Nonagri-cultural Occupations	Ratio: Teacher Salary/ Per Cap. GDP	Ratio: Teacher Salary/ Nonagric. Wage
United States	Elementary	1984	21,452	15,707	17,306	1.37	1.24
(dollar)	Secondary	1984	22,667	"	"	1.44	1.31
	Elem + Sec	1984	22,019	"	"	1.40	1.27
Canada	Elementary	1984	33,583	17,641	NA	1.90	NA
(dollar)	Secondary	1984	37,836	"		2.14	
	Elem + Sec	1984	35,126	"		1.99	
United	Primary	1984	9,158	5,668	7,794	1.62	1.18
Kingdom	Secondary	1984	9,575	"	"	1.69	1.23
(pound)	Prim + Sec	1984	9,401			1.66	1.21
Germany (FR)	Primary	1982	44,540	25,923	32,053	1.72	1.39
(mark)	Secondary	1982	50,756	"	"	1.96	1.58
Netherlands	Primary	1982	39,718	25,776	NA	1.54	NA
(guilder)	Secondary	1982	60,061	"		2.33	
Sweden	Junior	1984	108,504	94,674	NA	1.15	NA
(crown)	Intermed.	1984	110,892	"		1.17	
	Upper sec.	1984	129,456	"		1.37	
Denmark	Primary/						
(kroner)	Lower Sec.	1982	151,200	90,717	160,264	1.67	0.94
	Upper Sec.	1982	217,700	"	"	2.40	1.36
Japan	Elementary/						
(1,000 yen)	Lower Sec.	1984	4,577	2,482	3,726	1.84	1.23
	Upper Sec.	1984	5,037	"	"	2.03	1.35
	Elem + Sec	1984	4,695	"	"	1.89	1.26
South Korea	Primary	1984	5,650	1,700	3,563	3.32	1.59
(1,000 won)	Middle	1984	5,230	"	"	3.08	1.47
	Senior HS	1984	5,650	"	"	3.32	1.59
New Zealand	Primary	1986	27,560	13,617	17,805	2.02	1.55
(dollar)	Secondary	1986	34,650	"	"	2.54	1.95

Sources and Notes for Table 3

Sources: Teacher salary figures from Table 2; per capita GDP figures from International Monetary Fund, International Financial Statistics, July 1987; wages in nonagricultural occupations from International Labor Office, Yearbook of Labor Statistics, 1986.

Notes: Average teacher salary, per capita GDP, and wage in nonagricultural occupations are all expressed in units of national currency. Wages in nonagricultural occupations are reported by the ILO in terms of hourly or monthly rates. The former have been converted to yearly amounts by multiplying by 8 x 260, or 2,080 hours per year. The latter have been converted by multiplying by 12. This may result in overstatement of annual wages for the countries for which the ILO reports hourly wage rates.

compared with levels of pay in other countries, relative pay levels appear low, at least in relation to per capita GDP.

Note that the ratio of Canadian teachers' salaries to per capita GDP is about 50 percent higher than the ratio in the U.S., indicating that the high salaries paid to Canadian teachers do reflect higher relative positions on the economic ladder. Note also that the same ratio is much higher for South Korea than for any other country in the table (more than double the U.S. ratio), indicating that teachers enjoy an unusually elevated relative economic status in South Korean society.

The comparison with the average wage in nonagricultual occupations is inconclusive. The U.S. ratio of teacher salary to the wage indicator falls roughly in the mid-range of the ratios shown in Table 3. The ratios for Japan are essentially the same as those for the U.S., while those for Britain are slightly lower. Because of the data shortcomings cited above, I am disinclined to make much of these comparisons.

Salary Comparisons Based on Union Bank of Switzerland Data for Selected Major Cities

The Union Bank of Switzerland (UBS) from time to time issues a report entitled Prices and Earnings Around the Globe, in which it presents results of a survey of prices of selected goods and earnings in selected occupations in major cities of over 40 countries. One of the selected occupations is primary school teaching. The teachers' salaries reported by UBS are expressed in U.S. dollars, converted from national currencies at market exchange rates. As explained earlier, however, salaries converted at market exchange rates do not provide valid measures of the relative purchasing power of teachers in the various countries. For this report, therefore, I have reconverted the UBS salary figures for selected countries into national currencies, using the market exchange rates provided in the UBS reports, and then computed new U.S. dollar-equivalent salaries using the PPP exchange rates presented earlier.[5] Generally, the UBS reports contain data for only one major city in each country, but in the cases of Canada and the United States, they cover two cities and four cities, respectively. In these cases, I have used unweighted averages of the individual-city data to represent the country.[6]

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[5]This means, of course, that PPP rates for whole countries are being applied to salary figures for particular cities--a procedure that is not strictly correct but that is unavoidable, given the lack of PPP rates for the particular cities in question.

[6]The U.S. cities represented in the UBS reports are Chicago, Los Angeles, and New York plus, in the 1982 UBS report, San Francisco, and in the 1985 report, Houston. To maintain interyear comparability, I have taken into account only the first three cities in computing an average salary figure for the United States.

Table 4

COMPARISONS OF AVERAGE ANNUAL GROSS EARNINGS OF PRIMARY SCHOOL TEACHERS IN MAJOR CITIES OF SELECTED COUNTRIES, 1982 AND 1985

Country and Currency	City/Cities	1982 Average Salary			1985 Average Salary		
		National Currency	U.S. Dollar Equivalent (PPP Rate)	Ratio: Average Salary/ U.S. Avg Salary	National Currency	U.S. Dollar Equivalent (PPP Rate)[a]	Ratio: Average Salary/ U.S. Avg Salary
United States (dollar)	Chicago, Los Angeles, New York[d]	23,500	23,500	1.00	26,267	26,267	1.00
Canada (dollar)	Montreal, Toronto[d]	28,700	24,957	1.06	34,232	29,011	1.10
Australia (dollar)	Sydney	19,303	18,560	0.79	26,050	22,851	0.87
United Kingdom (pound)	London	7,703	14,814	0.63	9,274	17,174	0.65
Germany (FR) (mark)	Dusseldorf	43,761	18,701	0.80	45,030	19,493	0.74
Netherlands (guilder)	Amsterdam	45,453	19,260	0.82	42,521	18,249[c]	0.69
Sweden (kroner)	Stockholm	98,263	16,004	0.68	114,767	16,657	0.63
Denmark (kroner)	Copenhagen	134,273	15,723	0.67	165,280	18,718[c]	0.71
Norway (kroner)	Oslo	102,704	15,491[b]	0.66	128,126	18,148[b]	0.69
France (franc)	Paris	77,263	13,230	0.56	84,786	13,206	0.50
Belgium (franc)	Brussels	613,061	16,583	0.71	658,462	17,255[c]	0.66
Italy (1,000 lire)	Milan	10,658	11,725[b]	0.50	17,255	16,036[b]	0.61

Table 4 (continued)

COMPARISONS OF AVERAGE ANNUAL GROSS EARNINGS OF PRIMARY SCHOOL TEACHERS IN MAJOR CITIES OF SELECTED COUNTRIES, 1982 AND 1985

Country and Currency	City/Cities	1982 Average Salary			1985 Average Salary		
		National Currency	U.S. Dollar Equivalent (PPP Rate)	Ratio: Average Salary/ U.S. Avg Salary	National Currency	U.S. Dollar Equivalent (PPP Rate)[a]	Ratio: Average Salary/ U.S. Avg Salary
Austria (schillings)	Vienna	182,059	12,145[b]	0.52	206,208	13,674[b]	0.52
Japan (1,000 yen)	Tokyo	4,327	18,663	0.79	4,644	20,656	0.79
South Korea (1,000 won)	Seoul	4,444	15,752	0.67	6,641	17,552[c]	0.67

Source: Union Bank of Switzerland (UBS), Prices and Earnings Around the Globe, Zurich, 1982 and 1985 editions.

Note: Salaries in the UBS report are expressed in U.S. dollars, converted from the original currencies at market exchange rates. For this table, they have been reconverted to national currencies using the same exchange rates and then translated into equivalent dollars using PPP rates.

[a]1985 PPP rates not yet available; 1984 rates used instead.

[b]Consumption PPP rates not available; PPP rates for gross domestic product used instead.

[c]PPP rate not available for 1984; 1983 rate used instead.

[d]Average salaries shown are unweighted means of the salaries reported for the named cities.

The results of these calculations, shown in Table 4, are for 1982 and 1985, the years covered by the two most recent UBS surveys.[7]

The principal question in interpreting Table 4 is what to make of the fact that the reported salaries are for selected major cities. In the United States, teachers' salaries are generally considerably higher in major urban areas than elsewhere. Specifically, the 1982 three-city average salary of $23,500 reported for the U.S. in Table 4 is 25 percent higher than the national average of $18,800 reported for 1982 by NEA, and the 1985 three-city average of $26,267 is 14 percent above the NEA's estimate of $23,100 for the U.S. as a whole in the same year. Certain other countries, including some with centralized systems, also offer extra pay to teachers in major cities, especially their capitals, often on the grounds that teachers in those areas face higher costs of living. For instance, France and the United Kingdom offer explicit cost-based increments to teachers in Paris and London, respectively. However, many countries do not have such differentials, and those that do pay varying amounts, so the limitation of the data to selected major cities can distort the international comparisons.

Many of the major city salaries in Table 4 are compatible with the national average salaries reported in Table 2 (taking into account salary differentials in favor of the cities), but there are some exceptions. For instance, the 1982 figure for Copenhagen in Table 4 is considerably and implausibly lower than the 1982 figure given for Denmark in Table 2. Unfortunately, a number of the countries represented in Table 4 are not included in Table 2, so no corroboration of the figures for those countries is possible.

The ratios of foreign to U.S. salaries shown in Table 4 are generally smaller than those shown in Table 2. That is, U.S. teachers appear relatively better paid when the comparison is limited to salaries of teachers in major cities. For instance, according to Table 2, Germany paid its primary teachers at about the U.S. level in 1982; but according to Table 4, salaries in Dusseldorf in that year were only 80 percent of the average salaries paid in Chicago, Los Angeles, and New York. Note, however, that the superiority of Canadian to U.S. salaries shows up in Table 4, even though the margin of superiority is only about half as large as in Table 2. This pattern is consistent with the observation that there are larger salary differentials in favor of teachers in major cities in the United States than in other countries. Many of the countries represented in Table 4 operate centralized educational systems in which salary structures are nationally uniform except insofar as there are explicit locational allowances. Even where such allowances exist, they tend to be modest and do not generate pay differences as

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[7]Because PPP rates are not yet available for 1985, I have had to apply the 1984 PPP rates from Table 1 to the reconverted UBS data for 1985. Since most countries' PPP rates seem to change relatively slowly from year to year, this should not distort the results substantially.

large as those encountered in the U.S.[8] To a certain extent, therefore, the impression of higher relative pay in the U.S. that emerges from Table 4 is an artifact of the wide variance in teacher pay permitted by the decentralized American system.

Finally, note that the choice of the comparison year makes a significant difference in some cases. According to Table 4, Canadian, Australian, British, and Italian teachers all were better paid relative to U.S. teachers in 1985 than in 1982. This may reflect the relatively low rate of growth in teachers' salaries in the United States between those years. Similar year-to-year differences in relative pay show up in Table 2 for some of the few countries for which multiyear average salary data are available.

Salary Comparisons Based on UNESCO Data on Teacher "Emoluments"

Each year, UNESCO publishes its Statistical Yearbook containing, among many other things, basic education statistics for most of the world's countries. Among the variables reported are numbers of teachers and expenditures for teacher "emoluments," both by level of education. Using these data, it should be possible, in principle, to compute emoluments per teacher at the primary and secondary levels and to compare these amounts among countries. Selected emoluments data from the 1985 and 1986 editions of the yearbook and computed ratios of emoluments per teacher are presented in Table 5. As in previous tables, these figures are converted into U.S. dollar equivalents at PPP rates and then expressed as ratios to U.S. average teacher salaries for the corresponding years.

Unfortunately, gaps and inconsistencies in the UNESCO data limit the numbers and types of comparisons that can be made and raise doubts about the validity of the results. One problem is missing data. Sometimes only numbers of teachers are reported for a country and sometimes only emoluments but not both. Sometimes the data on numbers but not the data on emoluments are disagreggated by level of education, or vice versa. In particular, no emoluments data for the U.S. are reported in the most recent UNESCO yearbook. Another problem is mismatched years. Frequently, the UNESCO data on numbers of teachers are for one year and the data on emoluments are for an earlier year. There is also a problem of inconsistency in defining levels of education. I encountered several cases in which numbers of teachers are broken down into one set of grade-span groupings and emoluments data into another (e.g., lower-secondary teachers are grouped with upper-secondary teachers for the purpose of counting teachers but with primary teachers for the purpose of reporting emoluments). Finally, "emoluments" does not appear to be a well-defined

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[8]Note in this connection that the large cities reflected in the U.S. salary figure in Table 4 are located in states that pay salaries well above U.S. average levels. The substantial interstate variation in teacher salaries in the U.S. has no counterpart in most other countries.

Table 5

TEACHER "EMOLUMENTS" IN SELECTED COUNTRIES AND COMPARISONS WITH AVERAGE TEACHERS' SALARIES IN THE UNITED STATES (UNESCO DATA)

Country and Currency Unit	Year	Level of Education	Number of Teachers	Teacher Emoluments[a]	Emoluments per Teacher: National Currency	Emoluments per Teacher: U.S. Dollar Equivalent (PPP Rate)	Relative to U.S. Average Salary[b]
Canada (dollar)	1983	Prim + Sec	272,834	10,259 M	37,602	32,139	1.55
United Kingdom (pound)	1983	Primary	245,000	2,058 M	8,400	15,849	0.78
Germany, FR (mark)	1983	Primary	140,365	8,834 M	62,937	27,128	1.34
		Secondary	437,559	28,779 M	65,772	28,350	1.33
		Prim + Sec	577,924	37,613 M	65,083	28,053	1.35
Netherlands (guilder)	1982	Primary	60,434	3,543 M	58,626	24,841	1.32
Sweden (kroner)	1983	Prim + Sec	91,954	19,312 M	210,018	32,064	1.55
France (franc)	1982	Primary	206,198	31,824 M	154,337	26,428	1.41
		Secondary	318,452	62,806 M	197,223	33,771	1.70
		Prim + Sec	524,650	94,630 M	180,368	30,885	1.60
Italy (1,000 lire)	1983	Prim + Sec	815,288	13,872 B	17,015	15,610	0.75
Belgium (franc)	1984	Primary	43,958	53,841 M	1,224,828	32,097[c]	1.50
New Zealand (dollar)	1983	Prim + Sec	34,718	916 M	26,396	15,527[d]	0.75
Japan (1,000 yen)	1982	Prim + Sec	1,057,043	4,360 B	4,124	17,789[c]	0.92
South Korea (1,000 won)	1984	Prim + Sec	260,742	1,134 B	4,350	11,497	0.52

Sources: UNESCO Statistical Yearbook, 1985 and 1986; PPP rates from Table 1; U.S. average salaries from Table 2.

Notes:

[a]"Emoluments" is defined in the UNESCO yearbook as "salaries and all other benefits paid to teachers as well as to other auxiliary teaching staff"; however, no information is available as to precisely which nonsalary benefits are included in the emoluments reported for particular countries. The notations M and B in the "emoluments" column refer to millions and billions, respectively.

[b]Dollar equivalent emoluments per teacher are compared with U.S. average salaries for the corresponding educational levels and years, as reported in Table 2. Note, however, that "emoluments" include more than salary, and hence the figures in this column generally overstate the ratios of non-U.S. to U.S. salaries.

[c]1984 PPP rate not available; 1983 rate used instead.

[d]PPP rate not available for New Zealand; market rate of 1.5 NZ dollars per U.S. dollar used instead.

or consistently defined term. Although the official definition in the UNESCO yearbook stipulates that emoluments include "salaries and all other benefits paid to teachers as well as to auxiliary teaching staff," it is unclear which nonsalary items are included and excluded for each country. Reporting practice is certainly inconsistent in this regard. Moreover, the reference to "auxiliary teaching staff" is troubling, since there is great ambiguity regarding the types of staff that different countries might count in this category. The figures in Table 5 should be considered in light of these reservations.

Some of the emoluments per teacher figures in Table 5 are reasonably consistent with the salaries reported in previous tables, but others deviate sharply, most often in an upward direction. As examples, the UNESCO figure for emoluments per teacher in Canada in 1983 is Canadian $37,000 dollars, whereas the corresponding average salary from Table 2 is $32,000; the emoluments per teacher figures for primary and secondary teachers in Germany in 1983 are DM 62,900 and DM 65,800, respectively, as compared with average salaries one year earlier of DM 44,500 and DM 50,800 (from Table 2); and emoluments per teacher in Sweden are given as 210,000 kroner in 1983, as compared with 1984 average salary figures in the 110,000 to 130,000 range according to Table 2. The inclusion of nonsalary items and/or auxiliary staff in the emoluments data presumably accounts for some of these disparities. On the other hand, some other explanation is needed of why the emoluments per teacher figures for Japan and South Korea are lower than the corresponding salary amounts in Table 2. In general, it is hard to escape the conclusion that there are major unknowns and inconsistencies in the UNESCO data.

Given the properties of the data, it is not surprising that the emoluments of Canadian and most European teachers (other than in the United Kingdom and Italy) look impressive compared with average teacher salaries in the United States. That is, the ratios in the last column of Table 5 are in the 1.3 to 1.5 range for these countries. The most likely reason for the high ratios, however, is that the European emoluments data probably include substantial nonsalary rewards, whereas the denominator of the ratios, the U.S. average salary, does not. Unfortunately, there is no way to construct a U.S. teacher emoluments estimate, containing nonsalary as well as salary compensation, against which the seemingly high figures for other countries may be compared.

Conclusions

The primary conclusion from this examination of average teacher salaries concerns data acquisition and data quality rather than substance. Piecing together a multicountry data base from diverse individual-country sources using informal, low-intensity methods seems not to be a good strategy for making serious international comparisons. There are simply too many unanswered questions about the data for one to have much confidence in the results. Such work requires a more thorough and systematic approach--one that yields well-documented salary data plus enough

contextual information to support interpretations of intercountry comparisons.

As to substance, the rough comparisons that I have been able to make do support a few broad conclusions: that absolute levels of teacher pay in the U.S. are higher than in most other advanced countries but significantly lower than in Canada and about the same as in Japan; that teachers are paid more relative to national levels of economic activity (per capita GDP) in other advanced countries than in the U.S.; and that there appear to be some significant structural differences between the U.S. system and some other national salary systems, especially with regard to pay differentials between primary and secondary teachers. There are many more detailed comparisons to be made, but these cannot reasonably be attempted with the data in hand.

3. RELATIONSHIPS BETWEEN SALARY AND SENIORITY

Although comparisons of average salaries are important, they shed light on only one dimension of international variations in teachers' pay. In addition to differences in average salary levels, there are also variations in salary structure to consider. Most prominent among these are variations in the relationships between salary and teacher experience, or seniority.[1] Universally, among the countries for which data are available, teachers are paid according to salary schedules that explicitly reward seniority. The salaries of the most senior and most junior teachers with given qualifications vary in some countries by ratios of three to one, and much of the within-country variance in teacher pay is due to the role of seniority as a salary determinant. This section, therefore, focuses on the seniority dimension of teacher pay. Specifically, it examines variations in salary-seniority relationships among countries and, particularly, between other countries and the United States.

Data on Salary Schedules

This part of the analysis is based mainly on official teacher salary schedules obtained from individual-country sources. Such schedules are published regularly by education ministries or other national or sub-national agencies, both for administrative purposes and to inform teachers and other interested parties of current and future salary provisions. Typically, these schedules take the form of matrices, in which the columns pertain to different categories of teachers (typically, teachers of different grade levels and/or teachers with different levels of qualifications) and the rows correspond to different experience, seniority, or age levels. These are the forms generally taken by local school district salary schedules in the United States, and similar forms are used in many other countries.

A capsule description of the sources of the available non-U.S. salary schedules is as follows (additional information on the individual-country data and data sources is provided in the Appendix): Salary schedules for the United Kingdom and the Netherlands for 1984 were obtained from official announcements, published for the benefit of teachers and other interested parties. In addition, schedules for those two countries and for the Federal Republic of Germany for 1981 or 1982 were obtained from the aforementioned three-country comparative study produced for the Netherlands Ministry of Education. Schedules for Denmark in 1984 (teachers of grades 1-10), Sweden in 1984 (primary teachers of grades

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[1]Another dimension of salary structure, salary differentials related to the level of teaching (i.e., primary versus secondary) has already been referred to briefly in Section 2. A third dimension, salary differentials related to training or level of qualification, is alluded to in this section; but since there is little international comparability in categories of training or qualification, I have not attempted a full analysis of that aspect of salary variation.

1-3 only), and Italy in 1985 were provided by the respective countries' embassies. Salary scales for Australia in 1981 and 1984 were provided by the Australian Teachers' Federation (the national teachers' union). New Zealand data for 1986, contained in official government announcements, were provided by a New Zealand education official visiting the United States. Detailed salary schedules for Japan for the years 1981 through 1984 were collected during a visit I made to Japan and through subsequent correspondence (see Barro, 1986). Schedules for South Korea for the same years were specially compiled for this study by Korean education officials through the good offices of the South Korean embassy. Salary scales were also obtained for France but could not be used for most purposes because of insufficient information on how to translate them into salary-seniority schedules. No salary schedule data are presented for Canada, because no national salary scale exists in that country's decentralized education system.

The United States salary system is even more decentralized than Canada's, and there are, of course, no national, or even statewide, salary schedules for U.S. teachers. However, to provide some basis for comparison between the United States and other countries, I have synthesized a "typical" U.S. salary scale out of data extracted from the salary schedules of a sample of local school districts. Very briefly, this synthesis was carried out as follows: First, I obtained from the American Federation of Teachers (AFT) summaries of the teacher salary scales used in 78 local school districts. Second, using selected data from the salary scales, I calculated weighted averages (weighting for district size) of the salaries paid by these sample districts to teachers with certain standard combinations of education and experience (bachelor's degree and 5 years experience, master's degree and 10 years experience, etc.). Third, I appled a correction factor to adjust for the difference in average salary levels between the districts in the AFT sample (which tend to be large, urban, and northeastern) and the average salary in the nation as a whole. The resulting estimates of relative salaries at selected seniority levels are shown in subsequent tables. Characteristics of this synthesized U.S. salary schedule, the limitations of the estimates, and additional details of the synthesis methodology are discussed in Barro (1986).

There are numerous difficulties in interpreting the various countries' salary schedules and many reasons to be skeptical about the validity and intercountry comparability of the salary-scale data. Salary schedules are produced for internal use, and hence are generally not accompanied by the types of explanatory material that would be needed to make them intelligible to outsiders. As examples, schedules from Germany and the Netherlands contain multiple pay scales, apparently corresponding to differences in teacher qualifications and/or teacher proficiency, but I have not learned precisely what determines a teacher's placement or how teachers progress from one scale to another. In the case of the United Kingdom, the same problem is compounded by the existence of considerable local discretion in placing teachers on scales and promoting them from one scale to another. In France, there is an elaborate hierarchy of teacher categories, each with its own pay scale,

Table 6
RELATIVE SALARY IN RELATION TO SENIORITY,
SELECTED COUNTRIES AND CATEGORIES OF TEACHERS

Years of Service	Salary Relative to Starting Salary: United States[a] Teachers with BAs (1984)	United States[a] Teachers with MAs (1984)	United Kingdom[b] Scale 1 (1984)	United Kingdom[b] Scale 2 (1984)	United Kingdom[b] Scale 3 (1984)	United Kingdom[b] Scale 4 (1984)	Federal Republic of Germany[c] Primary (1981)	Federal Republic of Germany[c] Secondary (1981)
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2			1.05	1.04	1.04	1.04	1.00	1.00
3			1.08	1.08	1.07	1.08	1.05	1.06
4			1.12	1.11	1.11	1.12	1.05	1.06
5	1.19	1.21	1.15	1.16	1.15	1.16	1.09	1.11
6			1.19	1.20	1.19	1.20	1.09	1.11
7			1.24	1.24	1.24	1.24	1.14	1.17
8			1.28	1.28	1.28	1.30	1.14	1.17
9			1.33	1.32	1.33	1.34	1.19	1.23
10	1.47	1.49	1.37	1.37	1.38		1.19	1.23
11			1.42	1.42	1.43		1.24	1.28
12			1.47	1.47			1.24	1.28
13			1.52	1.53			1.28	1.34
14			1.57	1.58			1.28	1.34
15	1.65	1.73	1.63				1.33	1.40
16							1.33	1.40
17							1.38	1.46
18							1.38	1.46
19							1.43	1.51
20	1.65	1.73					1.43	1.51
21							1.47	1.57
22							1.47	1.57
23							1.52	1.63
24							1.52	1.63
25							1.57	1.68
26							1.57	1.68
27							1.62	1.74
28							1.62	1.74
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Table 6 (continued)

RELATIVE SALARY IN RELATION TO SENIORITY,
SELECTED COUNTRIES AND CATEGORIES OF TEACHERS

Years of Service	Salary Relative to Starting Salary						
	Netherlands[d]				Italy[g]		
	Primary (1984)	Secondary (1984)	Sweden[e] (1984)	Denmark[f] (1984)	Elementary (1985)	Middle (1985)	Upper Sec (1985)
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	1.03	1.01	1.02	1.00	1.00	1.00	1.00
3	1.05	1.03	1.03	1.03	1.06	1.02	1.08
4	1.08	1.05	1.06	1.03	1.12	1.08	1.08
5	1.11	1.08	1.08	1.04	1.12	1.08	1.16
6	1.14	1.11	1.09	1.04	1.15	1.11	1.16
7	1.17	1.13	1.15	1.06	1.20	1.16	1.24
8	1.20	1.16	1.17	1.06	1.20	1.16	1.24
9	1.23	1.19	1.18	1.13	1.28	1.24	1.32
10	1.27	1.22	1.21	1.13	1.28	1.24	1.32
11	1.30	1.25	1.23	1.18	1.37	1.32	1.40
12	1.33	1.29	1.24	1.18	1.37	1.32	1.40
13	1.36	1.33	1.28	1.22	1.45	1.40	1.48
14	1.39	1.36	1.30	1.22	1.45	1.40	1.48
15	1.41	1.39	1.31	1.26	1.53	1.48	1.56
16	1.44	1.43	1.34	1.26	1.53	1.48	1.56
17	1.46	1.48		1.31	1.62	1.56	1.64
18	1.49	1.51		1.31	1.62	1.56	1.64
19	1.52	1.54		1.32	1.70	1.64	1.68
20	1.54	1.57		1.32	1.70	1.64	1.68
21	1.57	1.61			1.74	1.68	1.72
22	1.59	1.65			1.74	1.68	1.72
23	1.62	1.68			1.78	1.72	1.76
24	1.64	1.72			1.78	1.72	1.76
25	1.67	1.75			1.83	1.76	1.80
26	1.70	1.79			1.83	1.76	1.80
27	1.72				1.87	1.80	1.84
28					1.87	1.80	1.84
29					1.91	1.84	1.89
30					1.91	1.84	1.89
31					1.95	1.89	1.93
32					1.95	1.89	1.93
33					2.00	1.93	1.97
34					2.00	1.93	1.97
35					2.04	1.97	2.01
36					2.04	1.97	2.01
37					2.08	2.01	2.05
38					2.08	2.01	2.05
39					2.12	2.05	2.09
40					2.12	2.05	2.09
41					2.17	2.09	2.13

Table 6 (continued)
RELATIVE SALARY IN RELATION TO SENIORITY,
SELECTED COUNTRIES AND CATEGORIES OF TEACHERS

Years of Service	Salary Relative to Starting Salary - Australia[h] 2-3 Yrs. Training (1984)	Australia[h] 4 Years Training (1984)	New Zealand[i] Primary Scale 1 (1985)	New Zealand[i] Primary Scale 3 (1985)	New Zealand[i] Secondary with BA (1986)	Japan[j] (teachers with BA) Primary (1984)	Japan[j] (teachers with BA) Secondary (1984)	South Korea[k] (1984)
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	1.13	1.07	1.04	1.04	1.07	1.06	1.06	1.03
3	1.19	1.14	1.09	1.08	1.16	1.12	1.12	1.06
4	1.26	1.21	1.15	1.14	1.24	1.17	1.17	1.09
5	1.33	1.27	1.21	1.20	1.33	1.23	1.23	1.09
6	1.39	1.33	1.28	1.25	1.41	1.29	1.29	1.19
7	1.46	1.38	1.34	1.32	1.52	1.35	1.35	1.19
8	1.50	1.45	1.40	1.38	1.65	1.40	1.40	1.29
9	1.54		1.47	1.45		1.46	1.46	1.29
10						1.52	1.52	1.39
11						1.58	1.58	1.39
12						1.64	1.64	1.49
13						1.71	1.71	1.49
14						1.78	1.78	1.62
15						1.84	1.84	1.62
16						1.91	1.91	1.74
17						1.97	1.97	1.74
18						2.04	2.04	1.86
19						2.10	2.10	1.86
20						2.17	2.17	1.98
21						2.23	2.23	1.98
22						2.29	2.30	1.98
23						2.35	2.36	2.10
24						2.40	2.43	2.10
25						2.46	2.49	2.10
26						2.51	2.54	2.21
27						2.56	2.60	2.21
28						2.60	2.66	2.21
29						2.65	2.71	2.32
30						2.69	2.76	2.32
31						2.73	2.81	2.32
32						2.77	2.85	2.43
33						2.80	2.89	2.43
34						2.83	2.92	
35						2.89	2.96	
36							2.98	
37								
38								
39								
40								
41								

Sources and Notes for Table 6

Sources: See Appendix A.

Notes:

[a]The data shown for the U.S. are based on a synthesized "typical" teacher salary schedule, as described in the text.

[b]Movement is possible between scales, which means that the data shown here may understate the salary ranges and length of the pay scale for at least some teachers. In addition, the UK system includes a pay scale for "senior teachers" not shown here.

[c]The scale shown for German primary teachers is known as Scale A12 of the German civil service pay system. The scale shown for secondary teachers is Scale A14, the lower of two scales applicable to teachers at that level. The higher scale, A15, is not shown. The steps on these scales are linked to age rather than seniority. The starting salaries shown correspond to age 21.

[d]The primary scale is for fully qualified ("B certificate") teachers. The secondary scale shown is the middle one of 11 secondary scales, corresponding to different levels of qualification and/or proficiency. The steps in the scales are linked to age rather than seniority. The starting salary shown for primary teachers corresponds to age 21, and that shown for secondary teachers corresponds to age 22.

[e]The Swedish scale is for primary teachers in grades 1-3 only. Data for teachers of higher grades are not available.

[f]The Danish scale shown is for teachers of grades 1-10. A different scale (not available) pertains to upper secondary (Gymnasium) teachers.

[g]The Italian scales shown omit provisions for midyear pay increases during the early years of teaching.

[h]The same pay scales apply to primary and secondary teachers with given levels of training.

[i]An intermediate primary scale (Scale 2) is not shown. In addition to the secondary scale shown, there is also an additional secondary scale for teachers with master's degrees.

[j]The scale labeled "primary" applies to teachers of both primary and lower secondary grades (i.e., all compulsory grades of schooling). Teachers with master's degrees are rewarded by advancement three steps along the applicable pay scale.

[k]The scale shown, which applies to both primary and secondary teachers is for qualified university graduates.

and salary advancement apparently is affected by success in passing examinations as well as by seniority. Unfortunately, I have not obtained a sufficient explanation of the rules for progressing along or between scales to make use of the French salary schedule data. Even in the case of Japan, where the seniority system appears well-defined, there are provisions for advancing along pay scales at more than the normal one-step-per-year rate (Barro, 1986). Such problems of interpretation, coupled with the underlying problems of defining teacher categories and "salary" uniformly, raise considerable doubts about whether salary-seniority relationships are being fully and accurately described.[2]

Apart from the individual-country salary scales, I have made use of one supplementary data source, a recent report published by the World Confederation of Organizations of the Teaching Profession (WCOTP), entitled Study on Teachers' Working Conditions in Europe (WCOTP, 1986). This report offers only salary ranges and not salary schedules, but what makes it relevant to this analysis is that it also indicates the numbers of years required to advance from the minimum to the maximum salary in each country. From that information, one can estimate the average steepness (slope) of each salary schedule. Thus, there is some opportunity to corroborate the information obtained from the diverse individual-country sources.

Comparisons of Salary Scales (Individual-Country Data)

Data on relative salary as a function of seniority are presented in Table 6 for all countries for which usable information was obtained. In some cases, data were acquired for multiple years, but only the figures for the latest available year are displayed. Where applicable and where data permit, separate salary scales are shown for primary and secondary teachers or, in a few cases, for teachers with different levels of qualifications. The data for the United States, which cover only selected levels of seniority, are from the synthesized "typical" U.S. salary schedule described above.

It can be seen from Table 6 that there are substantial international variations in both the lengths of salary scales (the numbers of years for which teachers continue to earn pay increments for seniority) and the range of variation in pay between more senior and less senior teachers. With respect to length, some countries have short scales, which "top out" in 10-15 years or less. The United Kingdom, Australia, and New Zealand

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[2]One saving grace in the analysis of salary schedules, as compared with the analysis of salary levels, is that the former are much less affected by how "salary" itself is defined and measured. This is because the salary schedule comparisons are of relative salaries paid to more senior and less senior teachers and not of absolute salary amounts.

fall into this group;[3] Sweden, with a 16-year scale, also has a relatively short scale as does the United States, where most (but not all) local salary schedules reach their ceilings in 10-15 years. At the other end of the spectrum, Italy, Japan, and South Korea contine to offer seniority-based pay increments essentially throughout a teacher's career (i.e., for 41, 36, and 33 years, respectively). The other countries represented in Table 6, Germany, the Netherlands, and Denmark, fall in between, with scales that extend 28, 27, and 20 years, respectively.

As to range of variation, the ratio of maximum to minimum salary varies from only about 1.3 in Sweden and Denmark and about 1.5 in Australia and New Zealand to nearly 3.0 in Japan, 2.4 in Korea, and 2.1 in Italy. Such countries as Germany and the Netherlands fall in the middle range, with ratios of 1.6 to 1.8. The United States also belongs in the middle group, with estimated maximum-to-minimum salary ratios (based on the aforementioned synthesized salary schedule) of 1.65 for teachers with bachelor's degrees and 1.73 for teachers with graduate degrees. Note that these ratios take into account only the seniority-related pay variations along a single pay scale; salary variations associated with such nonseniority factors as degrees earned or amount of teacher training completed are not considered. In the United States, for example, taking into account the salary variation associated with teachers' degree levels as well as seniority would raise the ratio of maximum to minimum salary from the figures just mentioned to slightly over two to one.

Table 7 provides summary statistics on the two salary structure parameters referred to above--the length of the pay scale and the ratio of maximum to minimum salary. Note that in addition to the countries already mentioned, the table includes ratios of maximum to minimum salary for France, which vary from about 1.5 to 2.1 among the three categories of teachers listed.[4] In addition, this table presents an indicator of the steepness, or slope, of each pay scale. Steepness is defined as the average percentage increase in salary, relative to the base salary paid to a teacher with no experience, during the period for which teachers

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[3]The United Kingdom has multiple salary scales for different categories of teachers. The individual scales are short, but there are some provisons for teachers to be promoted from one scale to another. Thus, some teachers, at least, continue to earn seniority increments for more years than the lengths of the individual scales suggest.

[4]The categories of French teachers represented in the table are categories employed mainly in elementary, lower secondary, and upper secondary schools, respectively; however, these are only three out of the dozen or so categories of teaching personnel in the French system. Note that no figures are shown for the scale-length and steepness parameters for France because of the aforementioned uncertainties regarding the operation of the French system.

Table 7

PARAMETERS OF SALARY-SENIORITY SCALES,
SELECTED COUNTRIES AND YEARS

Country and Teacher Category	Year	Ratio of Maximum to Minimum Salary	Years to Reach Maximum Salary	Average Seniority Increment as Percent of Base Salary[a]
United Kingdom[b]				
Scale 1	1984	1.63	15	4.2
Scale 2	1984	1.58	14	4.1
Scale 3	1984	1.43	11	3.9
Scale 4	1984	1.34	9	3.8
Federal Republic of Germany				
Primary	1981	1.62	28	2.2
Secondary	1981	1.74	28	2.6
Netherlands				
Primary	1984	1.72	26	2.8
Secondary	1984	1.79	26	3.0
Sweden				
Primary	1984	1.34	16	2.1
Denmark				
All levels	1984	1.32	20	1.6
France				
Instituteur	1983	1.50	c	c
Prof. Certifie	1983	1.90	c	c
Prof. Agrege	1983	2.08	c	c
Italy				
Primary	1985	2.17	41	2.9
Middle	1985	2.09	41	2.7
Upper secondary	1985	2.13	41	2.8
Australia				
2-year training	1984	1.54	9	6.0
4-year training	1984	1.45	8	5.6

Table 7 (continued)

PARAMETERS OF SALARY-SENIORITY SCALES,
SELECTED COUNTRIES AND YEARS

Country and Teacher Category	Year	Ratio of Maximum to Minimum Salary	Years to Reach Maximum Salary	Average Seniority Increment as Percent of Base Salary[a]
New Zealand				
Primary	1985	1.47	9	5.2
Secondary	1986	1.65	8	8.1
Japan				
Primary + lower sec.	1984	2.89	35	5.4
Upper secondary	1984	2.98	36	5.5
South Korea				
All levels	1984	2.43	32	4.5
United States[d]				
Bachelor's degrees	1984	1.65	10 - 15	4.3
Graduate degrees	1984	1.73	10 - 15	4.9

Source: Computed from salary scales in Table 6.

Note: Notes from Table 6 regarding the selection of scales for each country are applicable to this table as well.

[a]Average seniority increment per year of seniority is given by (Max. salary/Min. salary - 1)/(Years to reach maximum).

[b]Movement from one scale to another is possible; therefore, parameter values understate salary ranges and the length of the pay scale for at least some teachers.

[c]Not available because of incomplete information regarding rules for progressing along the pay scales.

[d]Data based on synthesized "typical" U.S. salary scale. Number of years to reach maximum salary varies among local school districts, with most districts falling in the range of 10 to 15 years. Percentage increments shown in the last column correspond to a scale length of 15 years.

continue to earn pay increments based on years of service. That is, steepness is given by the formula,

Steepness = (Max. salary/Min. Salary - 1)/Length of Pay Scale.

For example, the ratio of maximum to minimum salary for primary teachers in the Netherlands is 1.72, which means that salary increases by 72 percent over the 27-year period for which seniority-based increments are offered, or at an average of 2.8 percent (72/27) per year.

The "steepness" column of Table 7 shows that the average annual seniority-based increment in pay varies from only 1.6 percent for Danish teachers, 2.1 percent for Swedish primary teachers, and 2.2 percent for German primary teachers to as much as 5.5 to 6 percent for teachers in Australia, New Zealand, and Japan. However, these figures need to be looked at in conjunction with the range and length statistics to form a complete picture of intercountry variations in salary-seniority relationships. For instance, although Australia and Japan both offer steep salary scales, the Australian scales top out after only 8 or 9 years, leaving the most senior teachers with only 50 percent more pay than starting teachers, while the Japanese scales continue much longer, resulting, after 36 years, in salaries three times as great for highly senior teachers as for teachers just starting out. The steepness of United States pay scales appears to be in the mid-range of about 4.5 percent (about the same as in the United Kingdom), but this assumes a schedule length of 15 years. In reality, there is considerable variation among U.S. districts in the points at which pay scales top out, and thus there is comparable variation in the steepness of U.S. salary schedules.

Note that the steepness figures in Table 7 do <u>not</u> provide comparisons of the total annual percentage increases in pay enjoyed by teachers in different countries. An individual teacher's annual pay increase is determined by both the salary increment, if any, to which the teacher is entitled by virtue of increasing seniority and the amount by which the pay scale itself is adjusted upwards to reflect cost-of-living increases or for other reasons. Only the seniority increments are shown in the table. I do not have the data needed to compare overall trends, or rates of increase, in teachers' pay across countries.

To provide a somewhat different perspective on the same set of salary scales, Table 8 compares relative salaries at selected seniority levels (1, 5, 10, 15, 20, and 35 years). As in the previous tables, the entries in this table are ratios of the salary paid teachers at specified seniority level to the salary paid to an inexperienced (first-year) teacher. Intercountry differences in both the steepness of pay scales and the salary topping-out points are evident in these comparisons. Note, for instance, that at the 10-year experience level, teachers in Austalia, Japan, and the United States are paid considerably more relative to starting salaries than are teachers in the other countries. By the 20-year point, however, the relative salaries of teachers in several other countries have caught up or nearly caught up to those of the U.S.

Table 8

SALARIES AT SELECTED EXPERIENCE LEVELS RELATIVE TO STARTING SALARIES, SELECTED COUNTRIES AND YEARS

Country and Teacher Category	Year	Experience (Years of Service) 1	5	10	15	20	35
United Kingdom[a]							
Scale 1	1984	1.00	1.15	1.37	1.63	1.63	1.63
Scale 2	1984	1.00	1.16	1.37	1.58	1.58	1.58
Scale 3	1984	1.00	1.15	1.38	1.43	1.43	1.43
Scale 4	1984	1.00	1.16	1.34	1.34	1.34	1.34
Germany, Fed. Rep.							
Primary	1981	1.00	1.09	1.19	1.33	1.43	1.62
Secondary	1981	1.00	1.11	1.23	1.40	1.51	1.74
Netherlands							
Primary	1984	1.00	1.11	1.27	1.41	1.54	1.72
Secondary	1984	1.00	1.08	1.22	1.39	1.57	1.79
Sweden (primary)	1984	1.00	1.08	1.21	1.31	1.34	1.34
Denmark (all levels)	1984	1.00	1.04	1.13	1.26	1.32	1.32
Italy							
Primary	1985	1.00	1.12	1.28	1.53	1.70	2.04
Middle	1985	1.00	1.08	1.24	1.48	1.64	1.97
Upper secondary	1985	1.00	1.16	1.32	1.56	1.68	2.01
Australia							
2-year training	1984	1.00	1.33	1.54	1.54	1.54	1.54
4-year training	1984	1.00	1.27	1.45	1.45	1.45	1.45
New Zealand							
Primary	1985	1.00	1.21	1.47	1.47	1.47	1.47
Secondary	1986	1.00	1.33	1.65	1.65	1.65	1.65
Japan							
Primary + lower sec.	1984	1.00	1.23	1.52	1.84	2.17	2.89
Upper secondary	1984	1.00	1.23	1.52	1.84	2.17	2.96
S. Korea (all levels)	1984	1.00	1.09	1.39	1.62	1.98	2.43
United States[b]							
Bachelor's degrees	1984	1.00	1.19	1.47	1.65	1.65	1.65
Graduate degrees	1984	1.00	1.21	1.49	1.73	1.73	1.73

Sources and Notes for Table 8

Source: Computed from salary scales in Table 6.

Note: Notes from Table 6 regarding the selection of scales presented for each country are applicable to this table as well.

[a]Movement between scales is possible; therefore salaries may top out later for at least some teachers.

[b]Data are based on synthesized "typical" U.S. salary scale and reflect the assumption that maximum salary is reached in 15 years.

and Australian teachers, which have already reached their ceilings; and by the 35-year point, teachers in Germany, the Netherlands, and Italy earn considerably higher salaries, relative to the salaries of starting teachers in their own countries, than do teachers in Australia or the U.S. To get a complete picture, one must consider both how steeply each salary scale rises and when it levels off.

Comparisons Based on the WCOTP Data

As explained earlier, a set of data compiled by WCOTP allowed me to compute for certain European countries the ranges, lengths, and steepnesses of salary scales, thereby providing a back-up set of comparisons. The WCOTP figures in Table 9 cover seven of the same countries as are represented in Table 7. In principle, the salary schedule parameters are similarly defined in the two tables. However, the range and length parameters in Table 7 were obtained directly from national salary schedules, while the corresponding parameters in Table 9 are based instead on responses by national teachers' unions to a WCOTP survey.

Specifically, the maximum and minimum salary figures in Table 9 are based on the survey item,

> Indicate the gross earnings at starting level [at a final level], with all regular allowances, per month on January 1, 1986, in the different teacher categories,

while the length-of-scale figures are based on the item,

> Indicate the number of years normally needed before one reaches the final salary (WCOTP, 1986).[5]

There are some significant differences between the figures reported in Tables 7 and 9 for particular countries. As examples, the ratio of maximum to minimum pay in the Netherlands is 1.7 to 1.8 according to Table 7 but as high as 2.1 according to Table 9; in Italy, it is 2.1 to 2.2 in Table 7 (for 1985) but only 1.4 to 1.5 (as of Janauary 1, 1986) according to Table 9. Discrepancies with respect to the length of salary scales are relatively minor, but discrepancies in the computed steepness of the scales are sometimes large. For instance, the salary scales for Italy appear much less steep according to the WCOTP data than according to the official Italian data, while those for the Netherlands appear steeper according to the WCOTP figures. In most other instances, however,

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[5]The WCOTP survey also asks, "are there faster ways of realizing the final salary (merit, etc.)?" and "if such ways exist, please describe briefly." Of the countries represented in Table 9, only France reported that there is a method (passage of examinations) by which teachers can accelerate their progress along the scale.

Table 9

WCOTP ESTIMATES OF PARAMETERS OF SALARY-SENIORITY SCALES, SELECTED COUNTRIES, AS OF JANUARY 1, 1986

Country and Teacher Category	Earnings Range[a] (Swiss francs) Min	Max	Ratio of Maximum to Minimum Salary	Years to Reach Maximum Salary	Average Seniority Increment as Percent of Base Salary[b]
United Kingdom					
Scale 1	1,323	2,081	1.57	13	4.4
2	1,521	2,334	1.53	12	4.5
3	1,881	2,683	1.43	10	4.3
4	2,238	3,006	1.34	8	4.3
Senior teacher	2,411	3,258	1.35	8	4.4
Federal Republic of Germany[c]					
Primary + lower sec.	2,833	4,166	1.47	28	1.7
Upper sec. (scale A14)	3,250	5,100	1.57	28	2.0
Upper sec. (scale A15)	3,575	5,750	1.61	30	2.0
Netherlands[c]					
Primary	1,878	3,873	2.06	26	4.1
Secondary (scale I)	2,444	4,198	1.72	24	3.0
Secondary (scale II)	2,570	5,512	2.14	23	5.0
France					
Instituteur	1,972	3,052	1.55	26	2.1
Prof. Certifie	2,033	3,915	1.93	26	3.6
Prof Agrege	2,220	4,899	2.21	26	4.6
Italy					
Primary	1,508	2,142	1.42	40	1.1
Middle + secondary	1,594	2,401	1.51	40	1.3
Sweden					
Primary + middle	2,119	3,079	1.45	18	2.5
Upper secondary	2,260	3,145	1.39	15	2.6
Denmark					
Primary + middle	2,699	3,580	1.33	18	1.8
Gymnasium	3,171	4,652	1.47	15	3.1

Sources and Notes for Table 9

Source: World Confederation of Organizations of the Teaching Profession, Study of Teachers' Working Conditions in Europe, Morges, Switzerland, Revised Edition, 1986.

Notes:

Note: No United States data are included in the WCOTP report.

[a]WCOTP presents salaries in Swiss francs, converted from national currencies at market exchange rates. These data do not reflect purchasing power parities of the various currencies and should not be used for international comparisons.

[b]Average seniority increment per year of seniority is calculated as (Max. salary/Min. salary - 1)/(Years to reach maximum).

[c]Scale identifications refer to different pay scales to which teachers may be assigned on the basis of qualifications and/or proficiency.

the two sets of data are sufficiently in agreement that we can be reasonably confident that the overall picture of salary-seniority relationships is correct.

Conclusions

Data from national salary schedules, generally supported by data gathered by WCOTP, demonstrate that there are some important differences in salary-seniority relationships among countries. The United States, along with a few other English-speaking countries, has salary schedules that level off relatively early, whereas certain other countries continue to reward seniority throughout the teaching career. There are also differences in the degree to which salary varies with seniority, with Japan, at one extreme, exhibiting almost a 3-to-1 range of variation, while Sweden and Denmark limit the range to only 1.3 to 1. The United States, with a range of about 1.7 to 1, is in between, as are most European countries.

These differences in the relationship of pay to seniority, coupled with other, previously mentioned differences in salary scales associated with teacher training and level of education, raise an interesting issue: are these differences in salary structures associated with differences in the characteristics, or the quality, of teachers? I cannot examine that issue here, but I note some questions to consider. For example, do countries that continue to reward seniority throughout the teaching career do better at retaining experienced teachers (are their turnover rates lower)? Do countries that do not adhere to the U.S. system of rewarding post-baccalaureate training have less highly trained teachers? If so, is there any discernible effect on quality? Does the European system of paying secondary teachers considerably more than elementary teachers (and requiring them to have higher levels of training) pay off in the quality of secondary school teaching forces? These and other such questions should be high-priority issues for further international-comparative research.

4. DATA COLLECTION EXPERIENNCES AND LESSONS LEARNED

As explained in the Introduction, the data for this report were gathered by a variety of informal, low-intensity methods. Inquiries were addressed to potential sources of information about the countries of interest, including not only their Washington embassies but also home-country agencies, research organizations, and in some cases individuals; leads were followed up with letters, telephone calls, and sometimes visits; and chains of referrals were pursued until data were obtained, dead ends were reached, or time or money ran out. Except in the case of Japan, no on-site data collection was conducted, and no structured data collection instruments were created.[1] No official (i.e., government-to-government) requests for data were made, although the NCES project officer, Dr. Larry Suter, did communicate with certain foreign officials of his acquaintance on behalf of the study.

I was assisted in the data collection effort by staff members of Applied Systems Institute, Inc. (ASI), which participated in the study under a subcontract. In particular, Dr. Joe Lee of ASI obtained the data from South Korea and assisted in translating and interpreting Japanese data, and other ASI staff handled much of the initial letter writing and telephoning and some of the translating. Statements in the first-person plural below refer to efforts I undertook jointly with the ASI staff.

We began the data acquisition work with an initial round of contacts with embassies in Washington, each consisting of a phone call and usually a follow-up letter. Subsequent steps depended on the initial response. In cases where the initial embassy contacts offered referrals to agencies in their respective capitals, the follow-up effort included second and sometimes third rounds of letter writing. In other cases, embassy staff members undertook to relay our requests to the cognizant agencies, and we had to wait for responses before proceeding further.

Meanwhile, we made other inquiries in parallel. Letters were dispatched to international agencies known to be active in the field, including the ILO, whose 1982 report on conditions of teaching first aroused NCES' interest in this study (see fn., p. 1). I visited the Washington offices of several such agencies, including OECD, the European Economic Community (EEC), and the World Bank. In addition, we obtained other referrals through personal contacts, which we also followed up by telephone or letter.

The results were extremely variable among countries. Accordingly, to convey an impression of how these informal inquiries worked out and what problems were encountered, I provide brief country-by-country summaries of our experiences.

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[1] In the case of South Korea, an informal form resembling a survey form was prepared at the respondent's request to make clear what kinds of data were wanted.

Country-by-Country Summary

The following individual-country accounts cover all the countries from which we attempted to obtain data except Japan.[2] The Japanese case is special in that it involved on-site data collection and yielded a separate, more detailed report (Barro, 1986), and I discuss it separately below. I comment first on countries with which we were at least moderately successful and then on countries from which we obtained little or no data, except that I leave to the end the two countries that were not initially to be included, South Korea and New Zealand, but for which we did acquire data when the opportunities arose.

Canada. We learned from an initial telephone call that Canada maintains a reference library at its Washington embassy, which holds numerous statistical reports published by Statistics Canada, including several series pertaining to education. One annual publication, Salaries and Qualifications of Teachers in Public Elementary and Secondary Schools, provides rich salary data, including average salaries and breakdowns of salary by various teacher characteristics, both for all Canada and by province. From various editions of this report, we extracted a full set of average salary figures for multiple years. Subsequently, during a visit to Vancouver, I was able to update the salary data at the local office of Statistics Canada.

Later in the study, I made contact, at a professional meeting, with an official of the national teachers' union (Canadian Federation of Teachers), and he eventually provided a second rich set of salary data plus several studies of teacher pay produced by the union. Thus, in the case of Canada, we could have obtained good data on salary levels, trends, and distributions from either of two sources. The Canadian data would support much more detailed salary comparisons than are presented in this report (limited, however, by the much sparser data available for the U.S.).

Like the U.S. system, the Canadian education system, including the teacher salary system, is highly decentralized, and so there are no national salary scales. From the aforementioned union data, we did obtain scales for a number of local and, in a few cases, provincial school systems, and it would be possible to construct from them a synthetic "typical" salary schedule for Canada as we did for the U.S. Regretably, we lacked the time and resources for that task, and so, abundance of data notwithstanding, I have not been able to present salary scales, or salary-seniority relationships for Canada.

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[2]At the outset of the study, I considered the possibility of expanding the data collection to countries other than highly developed, free-market economies, including selected Eastern Europe and some of the more advanced developing countries, such as Mexico and Brazil. Initial letters were sent to some of these countries' embassies, but responses were either lacking or unencouraging, and a decision was quickly made, with CES approval, to forego this extension of coverage.

Netherlands (and the Three-Country Study). The most broadly productive of our inquiries via embassies turned out to be that to the Netherlands--not so much because of the data it yielded on that country as because it brought to out attention a Three-Country comparative study of conditions of teaching produced under contract for the Netherlands Ministry of Education and Science (Organization for Research and Management, 1983). This study provided some of the data presented here on salaries in the United Kingdom and most of the data on salaries in the Federal Republic of Germany as well as in the Netherlands itself.

Our initial inquiry to the Netherlands embassy (by telephone) brought a referral to a division of the Netherlands Ministry of Education and Science. Our follow-up letter to that office produced an enthusiastic reply from Dr. T. Gloudemans of the Ministry, who, he informed us, was himself conducting a study of conditions of teaching, including salaries, in a number of member countries of the EEC. I had several contacts with Dr. Gloudemans, including a meeting with him in Washington during a visit of his to the United States. He eventually provided to us (after some inadvertent lengthy delays in transmission) several kinds of data on the Netherlands, including salary schedules for 1982 and 1984, a 1982 report entitled Conditions of Service of Teachers in the Netherlands, and background materials on the Dutch educational system.

Most important, Dr. Gloudemans provided a copy of the report on the aforementioned Three-Country study--a pilot study for a larger contracted study sponsored by the Netherlands Ministry, which apparently is still ongoing as of this date.[3] The pilot report presents salary schedules and estimates of average salaries in 1982 for the Netherlands, the United Kingdom (England and Wales), and the Federal Republic of Germany (mainly the state of North Rhine-Westphalia). It also provides explanations of the respective training, employment, and salary systems and data on working conditions and other aspects of the teaching job. Thus, in addition to providing data on the Netherlands, it provided basic information on salaries in the other two countries, thereby considerably easing our data collection task. At the same time, the availability of this information led us to devote less effort than we would have otherwise to collection of salary data from Germany and the UK, and so I cannot report fully here on the potential payoffs to data collection efforts in those countries (see comments on Germany and the UK, below).

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[3]The larger study, which is intended to provide descriptions of conditions of teaching in approximately 10 European countries, was to have been completed in the fall of 1986, but it is running at least a year late. Apparently, concerns of the education ministries in some of the countries being examined have caused long delays for review and revision. These same concerns have precluded comparative analysis and assessment, and consequently the product will consist mainly of individual-country descriptions. Nevertheless, this set of descriptive studies should, when completed, provide considerably more complete and detailed data than are reported here, including coverage of a broad array of nonsalary conditions of teaching.

United Kingdom. The British embassy in Washington referred us to to the British Information Service in New York, which maintains a substantial reference library. During a visit there, I obtained copies of an annual report, Education Statistics for the United Kingdom, which includes among its many tables a single table of average teacher salaries. I also was referred by Information Service staff to several possible sources of additional salary information in the UK.

Before I had a chance to contact these agencies, however, I was able to acquire information on UK salary scales from two other sources: one, a personal acquaintance in London, who provided a copy of the official salary schedules for 1984; the other, the aforementioned Netherlands Three-Country study, which provided salary scales for 1982, some average-salary estimates, and a partial explanation of how the salary system works. With these materials in hand, I chose not to allocate effort to further data collection from UK agencies. Consequently, although I believe that considerable additional material could have been acquired, particularly from the Statistics Branch of the Department of Education and Science and, perhaps, from the teachers' union, I have not confirmed this and cannot report definitively on data availability.

As this report was being prepared, however, I did make a chance contact, at a World Bank seminar, which revealed a source of richer data on UK teachers and salaries--namely, I met an official of an organization called LACSAB (Local Authorities' Conditions of Service Advisory Board), which represents local authorities (the employers) in negotiating salaries and other job conditions with the teachers' unions. This gentleman provided more up-to-data data, especially on average salaries, than I had previously acquired, and I was able to incorporate some of this material into the tables during the final revision of this document.

Federal Republic of Germany. Collecting data on teachers' salaries in Germany proved more difficult than expected, and consequently I have had to rely heavily on the information provided in the aforementioned Three-Country Study. Our inquiry to the German embassy in Washington was relayed to Bonn. It yielded a memorandum of unknown authorship, relayed to us through the embassy some four months later, containing a general explanation of the salary system and data on salary ranges, by level of education, for years 1980 through 1985. Neither average salary salaries nor salary scales were provided. No point of contact for follow-up inquiries was identified.

The memorandum did explain, however, which scales of the German federal civil service pay structure apply to different levels of teaching, and so later, when I obtained a salary matrix through a personal contact, I was able to select the appropriate scales. I also obtained essentially the same salary-scale information from the Three-Country Study. The latter source also provided some estimates of average salaries in 1982. However, these estimates are only for the state of North Rhine-Westphalia, and I do not know how closely they conform to national averages.

Later, through a chance contact with a faculty member at a German educational research center, I obtained additional salary data for the state of Rhineland-Palatinate but not in a readily intepretable form. As this material did not seem to add to what I already knew about the salary scales and did not include average salaries, I did not analyze it thoroughly. I was told by this same faculty member that he had contacted the State Statistical Office of Rhineland-Palatinate and been told that no salary averages were available from either state or federal sources. It is hard to believe that no German agency has compiled data on average teacher pay, but I have been unable to discover a source. I did not make contact with the German teachers' unions, however, and it is possible that something might be available from that quarter.

Sweden. Our inquiry to the Swedish embassy, following a preliminary phone call, was sent to the embassy's labor attache, who forwarded the letter to the Ministry of Education and Cultural Affairs in Stockholm. The attache was subsequently advised that the Education Ministry did not have the information but was relaying the request to a "Swedish employer's organization" that might be able to respond. Approximately five months later, we received from the National Swedish Agency for Government Employers a six-page memorandum containing replies to our questions. This memorandum (which we had translated from the Swedish) included a brief explanation of the pay structure and information on selected conditions of teaching, including fringe benefits and workload. It also provided average salaries for various categories of teachers in 1980 and 1984 and a sample pay scale for teachers in junior-level schools (grades 1-3) for 1984. A full set of official pay scales was also to have been sent but never arrived.

Denmark. In response to our initial telephone inquiry, the Danish embassy in Washington provided the address of the International Relations Office of the Ministry of Education in Copenhagen. Our letter to that office brought a reply (four months later) with a variety of statistical materials. These included a five-year compilation of salary schedules for teachers in grades 1-10, prepared by the teachers' union; a brief explanation of how the salary system works, and published statistics from Danmarks Statistik (the national statistical agency) on average earnings of several categories of teachers and of workers in other occupations. Thus, we acquired with relative ease usable data on both average salaries and salary-seniority relationships.

Australia. Like the UK, Australia maintains a substantial collection of reference materials at an Information Office in New York. I visited there and obtained copies of several reports on education statistics prepared by the Australian Bureau of Statistics. Unfortunately, although these provide detailed information on such things as pupils, schools, and staffing, they contain no salary data.

We obtained from the Australian embassy in Washington the addresses of several potential information sources. Some of our letters to these sources led to further referrals and then to dead ends. The letter that did produce results was to the Australian Teachers' Federation. I

received from this agency sets of salary scales for 1981 and 1984 (but without an explanation of how the scales work) and a study prepared by the union, 1984 National Survey of Conditions in Schools: Highlights Report, which provided considerable data on working conditions, hours and days, class sizes, etc. but nothing on salaries. Neither the union nor any other agency contacted was able to provide average salary figures.

Subsequently, a professional acquaintance offered to seek additional salary information during a trip to Australia. During discussions with Australian education officials, he obtained explanations of some of the unclear points concerning the union's salary scales but was unable to find average salary data. It appears, therefore, that such data may not be compiled, at least at the national level.

An important point to note about Australia is that the education system is highly decentralized by state. The salary scales provided by the union are state-specific, although the interstate differences in salary levels are generally minor. The Australian salary scales in this report were computed as weighted averages of the scheduled salaries offered by different states to teachers with given characteristics (see the Appendix for details).

Italy. A letter to the Italian embassy went unanswered for a long time, and a follow-up inquiry elicited the response that the request had been forwarded to the Education Ministry in Rome. Further telephone inquiries yielded no additional information. Nearly nine months after our initial inquiry, the embassy sent us salary tables that it had received from the Cultural Division of the Foreign Affairs Ministry, which, in turn, had apparently obtained the material from the Education Ministry. These tables consisted solely of a set of salary schedules. No explanatory information was attached and no average salary figures were included. Given the time lags and our failure to identify any contact at the Education Ministry, I did not pursue the issue further. Consequently, the only Italian data reported here are from the salary scales. These are presented with some trepidation, since I am not certain that I have interpreted the scales correctly.

France. The French teacher salary system is by far the most complex and least comprehensible to an outsider, and I had minimal success in penetrating its mysteries. Our inquiry to the embassy elicited a letter of response from the cultural attache, which included general descriptions of the many categories of French teachers and a set of salary scales for an unknown year, but no explanation of how the salary system works. Later, after being asked to write a more detailed letter explaining my study, I met with the cultural attache at the embassy. He was able to shed light on certain aspects of the system, such as how one associates salary figures with particular categories and ranks of teachers, but not on other critical matters, such as the rates at which teachers advance along the scales and the conditions under which they shift from one scale to another. He produced a more recent set of salary scales but could not provide average salary figures. He did provide a large descriptive and statistical report, published by the National Education Ministry, which

I had translated in relevant part. This report describes the structure of the staffing system and presents data on staffing patterns at each level of education, but unfortunately presents no additional salary information. It was politely indicated to me that the embassy was disinclined to pass more specific inquiries along to the Education Ministry in Paris and that replies to direct inquiries might be long in coming.

Subsequently, I did write directly to the Statistical Office of the French Education Ministry and also to an individual French education official to whom I was referred by Dr. Suter, but I never received replies to these inquiries. Frustrated by the nonresponses and the complexities of the system, I did not pursue the matter further. Consequently, I am unable to present either average salaries or salary-seniority schedules. The only French data shown in this report are figures on salary ranges and the UNESCO and UBS estimates of average salaries. This is one of the more important data gaps in the study.

Belgium. An initial inquiry to the Belgian embassy yielded referrals to several agencies in Brussels. Follow-up letters yielded further referrals but no data. Eventually, after another set of letters, we received from the Ministry of Employment and Labor a set of salary scales for civil servants, which was described as being "similar to" the salary schedule for teachers. No information on average salaries was provided. Lacking explanatory information on the operation of the scales, we were unable to interpret the data in hand. A further inquiry brought no reply, and we decided to drop Belgium from the study.

New Zealand. New Zealand was not one of the countries from which I originally planned to obtain data, but such data became available through the efforts of Dr. Larry Suter of NCES, and I have incorporated them into the report. Dr. Suter expressed an interest in teacher salaries to New Zealand education officials during a visit to Auckland and subsequently was mailed a set of official salary scales. These were not immediately usable, however, as they were unaccompanied by any explanatory material. Later, another New Zealand official, coming to Washington for a professional meeting, agreed to provide additional information. At a meeting with Dr. Suter and me at NCES, he explained how the different salary scales work and provided documentation on the salary system at the secondary level. He also provided average salary data. In this instance, data acquisition was wholly dependent on personal contacts and travel unrelated to the salary study.

South Korea. Like New Zealand, South Korea was not among the countries initially to be included in the study, and it is not yet attained the level of economic development of the other countries represented in this report. Nevertheless, when the opportunity to acquire South Korean data presented itself, I grasped it, both because of the high data quality and my desire to include a second Asian country (in addition to Japan) in the study.

I first became aware of the quality of Korean data by examining the annual publication, Statistical Yearbook of Education, published by the

Republic of Korea Ministry of Education, one edition of which was in the possession of Dr. Suter. This series provides highly detailed data on pupils, teachers, and teacher qualifications, including distributions of teachers by pay grade, but not the pay scales themselves. The opportunity to obtain detailed salary data arose because of the personal contacts of Dr. Joe Lee of ASI with personnel of the Korean embassy. An initial inquiry by Dr. Lee elicited one set of data on salaries and allowances. A follow-up inquiry brought an invitation from Mr. Yong-Won Ryoo, director of the embassy's education office, to specify in detail, by drawing up blank data tables, what additional information was wanted. Dr. Lee did this, and the request was forwarded to the Education Ministry in Seoul. Eventually, we received filled-in tables containing salary scales for multiple years, data on the distributions of teachers by salary bracket, and explanatory material on the salary system. Somewhat surprisingly, data on average salaries were said not to be available, but Dr. Lee was able to construct estimates by using the data on distributions of teachers by pay grade and then applying the rules for allowances and other salary supplements. Thus, through a personal contact and the special help of an embassy official, we were able to assemble detailed data on South Korea.

International Agencies. As indicated earlier, we addressed inquiries to a number of international agencies known to be involved in research or data collection in education. Foremost among these was the International Labor Office (ILO), which had published the previously mentioned report on conditions of teaching in a broad range of countries. Our specific purposes in contacting the ILO were to determine whether more detailed salary data were available than those published in the ILO report and whether the data had been or were being updated. The reply was negative on both counts. Moreover, a NCES colleague of Dr. Suter's reported, after visiting ILO headquarters, that the data files underlying the 1982 report were no longer in existence.

The other agencies contacted, including OECD, EEC, and UNESCO, did not have teacher salary data. UNESCO does, however, publish the statistics on numbers of teachers and teacher "emoluments" described and presented in Section 2. For reasons explained there, these figures are erratic and of dubious validity and do not constitute an acceptable substitute for salary data. Both OECD and the EEC publish general economic statistics, which we used, along with data of the World Bank and International Monetary Fund, for comparing relative salary levels among countries. The OECD is also the source of the purchasing-power-parity (PPP) data used to convert non-U.S. teachers' salaries into equivalent U.S. dollars (see Section 2).

Later in the study, I received, courtesy of Prof. Stephen Lawton of the Ontario Institute for Studies in Education, the two sets of international data that are presented in Sections 2 and 3: data on salary ranges compiled by the World Confederation of Organizations of the Teaching Profession (WCOTP) and estimates of average salaries of primary teachers in selected cities around the world produced by the Union Bank of Switzerland. Neither of these, for reasons previously explained, can

be considered a high-quality data set. Thus far, I have not encountered any effort by an international organization to collect reliable, internationally comparable figures even on average teachers' salaries, much less on the structures of teacher salary systems.

Data Collection in Japan

The case of Japan is of special significance because it may illustrate what can be accomplished by direct on-site data collection, as compared with the data-collection-at-a-distance approach that I had to resort to with other countries. By visiting education agencies in Japan and dealing directly with Japanese officials who routinely use teacher data, I was able to obtain more detailed data than for other countries and also to interpret the data in more depth and with greater certainty. The results are reflected in the previously issued report, A Comparison of Teachers' Salaries in Japan and the United States (Barro, 1986).

I do recognize, however, that the Japanese experience may not be generalizable to many other countries. Japan has a highly developed system of education statistics, supported by the strong central role played by the Ministry of Education, Science, and Culture (Mombusho) in the country's educational affairs. It is quite possible that in some other countries, especially those with weaker statistical agencies and/or more decentralized education systems, even on-site data collection would not yield all the desired information. It is also likely that the level of cooperation encountered in Japan would not be universally forthcoming. I believe, nevertheless, that the contrasting Japanese experience highlights the inherent limitations of data collection from afar and strongly suggests the desirability of allowing for in-country data collection in future studies of this type.

Our initial inquiries to Japan were the same as to the other countries. We phoned the embassy in Washington and then sent a follow-up letter to the education attache, Mr. Akinori Shimotori. We received in response a set of salary tables for 1981, extracted from the Japanese English-language publication Education in Japan Today, and some background information on the Japanese education system. Mr. Shimotori also provided names and addresses of persons in Japan to contact for additional information.

Shortly thereafter, in a visit to the Japan Information Service office in New York, I obtained data on teachers, schools, and students--but no salary information--from the Japan Statistical Yearbook. I was also able to identify some of the more detailed Japanese data sources, including the School Basic Survey and the Labor Ministry's Basic Survey of Wage Structure, but not to obtain the actual materials. At about the same time, a personal acquaintance, traveling to Japan on other education-related business, brought me some additional English-language statistical summaries, including an edition of Basic Facts and FIgures About the Educational System in Japan, which provided some data on average salaries and allowances. Thus, using the same indirect methods

as with other countries, I had acquired some data on average salaries and salary scales, although both were somewhat out of date and unaccompanied by sufficient explanatory material.

What enabled me to pursue the Japanese data in greater depth is that I decided to vacation in Japan and collect additional data while there. I had already been referred by Mr. Shimotori and the aforementioned acquaintance to Mr. Akio Nakajima of the Education Ministry. A meeting with an American specialist on Japanese education, Dr. William Cummings, then at the National Science Foundation, resulted in a referral to Mr. Shogo Ichikawa, an education finance specialist at the National Institute for Educational Research (NIER) in Tokyo. I was able to arrange appointments with both gentlemen before my departure.

The Ministry people and, especially, the NIER people turned out to be very cooperative. Both had prepared sets of materials for me, including data on average salaries and their components and salary schedules for multiple years. Mr. Ichikawa, in particular, was very patient in explaining the mechanics of the pay system and the nonsalary conditions of teaching. I was also given the names of detailed statistical publications, which I was able to purchase in the government bookstore in Tokyo. One of these, an earnings survey by the Ministry of Home Affairs, proved especially valuable because it provided details on the many allowances and bonuses that one must take into account, along with basic salary, to arrive at a correct estimate of Japanese teachers' pay.

I found after returning home that these materials provided most but not all of what I needed for the detailed Japan-U.S. salary comparisons in Barro (1986). (Dr. Joe Lee's contributions as a translator were very important at this point.) To clarify certain matters and fill in gaps in the data, I entered into several rounds of correspondence with Mr. Ichikawa at NIER. I also sent him an early draft of the report to review. His generous assistance, which, of course, stemmed from our discussions in Tokyo, was critical to the successful completion of the product.

It is conceivable that I could have obtained most of the same statistical material without traveling to Japan, although the process would have been very time consuming. Also, the probability does not seem high that I would have received some of the unpublished tabulations that were given to me during my visit. It is even less likely that I could have received the help that I did in interpreting and clarifying the data without establishing personal contact with the parties concerned. My experience has convinced me of the importance of interactive, on-site data collection in carrying out this type of international comparative work.

Data on Teachers' Salaries in the United States

A basic problem in carrying out international-comparative studies is the sparsity of statistics on some key aspects of education in the

United States. This applies specifically to comparisons of teacher salaries, but it would also be true of comparisons of such things as staffing patterns and education expenditures. The lack of official U.S. statistics on teachers' salaries in recent years made it necessary for me to rely on average salary figures produced by the NEA. (I also obtained AFT average-salary figures, but they were only negligibly different.) There are no U.S. data on salary distributions or breakdowns of salary by such categories as teacher experience. Had such data been available, it would have been possible to compare U.S. distributions with those in such countries as Canada and Japan, for which the more detailed salary data are available.

The lack of data on U.S. salary structures is mainly attributable to the decentralized nature of the U.S. system rather than to any deficiency in the data collection system. However, data on local district pay scales, which I needed to synthesize a "typical" U.S. pay scale, proved difficult to acquire. I discovered that the NEA maintains a large file of district pay scales, but our informal requests for access brought negative responses. That data set exists, I was told, to aid collective bargaining and not for research. The AFT was more forthcoming, but its sample of local pay scales is relatively small and less representative of the nation as a whole. Thus, there is uncertainty about the validity of the U.S. baseline against which I have compared the salary-seniority relationships of other countries.

General Observations and Lessons Learned

Finally, I attempt to draw some lessons for the future from this exercise in international data collection. Doing so is risky, I realize, since my experiences may not be generalizable; they may reflect, for instance, the specific subject matter of this study and the particulars of how and to whom I addressed my inquiries. Nevertheless, I feel that there is enough of a pattern to justify the following general observations.

1. Indirect data collection is unlikely to yield satisfactory results. Data collection through indirect channels and intermediaries (in my case, mainly via embassies) appears not to be a mechanism one can count on to yield usable information, even though in particular cases it may yield acceptable results. Obtaining data that one can be confident of having interpreted correctly usually requires direct contact with knowledgeable persons in the source country, who can interpret the data categories, explain the system, address fine points that would otherwise be overlooked, and provide clarifications as needed. These can be either producers or users of the data. Transactions through embassies or information offices fall short because they do not afford such contact and because the staff of such offices lack the requisite substantive expertise. This does not detract from the importance of such staff as sources of referrals. It also does not apply in special circumstances such as our inquiry to South Korea, where an embassy staff member was willing to participate in the inquiry and to provide access

that would otherwise have been unattainable. But generally, direct contact with substantive experts in the country in question seems a prerequisite for acquiring high-quality data.

2. Data collection by long distance is a cumbersome and time-consuming activity. It is possible to collect data directly but from a distance by relying on correspondence and telephone calls, but one must have the time to engage in a prolonged and sometimes awkward communication process. In this study, even countries that ultimately responded satisfactorily to our written requests for data sometimes took four to six months to do so. This made it infeasible in some cases to undertake follow-up data collection and to pursue important questions about the data. Even with a very cooperative respondent, as in Japan, I found that it sometimes took two months to ask clarification questions and receive written answers. Supplementary data and explanations that could be obtained almost immediately on the spot are thus difficult to acquire by "remote control." The more complex the data requirements, the less feasible is likely to be data collection from afar.

3. Data interpretation and clarification should be recognized as a distinct, resource-consuming activity. I did not appreciate before starting this study the importance of allowing time and resources for data interpretation and clarification. Acquiring the numerical data--in my case, salary averages and salary scales--proved to be only the midpoint of the process. In many instances, it was at least as difficult to obtain satisfactory explanations as to obtain the data themselves. In the future, I would present data interpretation and clarification as a separate subtask of an international-comparative study and as a separate budget item. In particular, I would allow more adequate resources for translation of foreign language materials, taking into account the need to translate not only tables and data definitions but also substantial amounts of explanatory and background material.

4. Formal surveys alone are unlikely to yield adequate data. Although I did not attempt to collect teacher salary data by means of formal surveys, my experience leads me to conclude that such surveys alone--that is, without direct interaction with the data providers--would be inadequate to the task. There is too much variability in education systems (in this case, salary structures) and data categories among countries for any standard set of survey categories to be universally applicable. Thus, respondents' attempts to respond within the confines of a survey form are likely to result in distortions and misinterpretations of data. These adverse effects are manifest, I believe, in the survey-based international data sets presented by such agencies as ILO and UNESCO. I do not mean to imply, of course, that a structured data collection instrument is not useful, but only that a free-standing survey, unaccompanied by direct communication with respondents, is unlikely to yield satisfactory results.

5. On-site data collection is the preferred strategy. Finally, I have become convinced that face-to-face, on-site data collection is by far the most effective, and probably the most cost-effective, data

collection strategy for this kind of international-comparative work. I admit that I may be unduly influenced in this regard by the contrast between my highly satisfactory on-site experience in Japan and my often disappointing experiences with data collection from afar with other countries. It is possible, certainly, both that on-site efforts would have been less productive elsewhere, say with less helpful respondents, and that more intensive long-distance efforts might have been more successful. Nevertheless, I feel that there are no real substitutes for two important advantages of the on-site approach: one, the immediate feedback that is possible when one can inspect data and ask questions on the spot; the other, the personal contact that facilitates follow-up inquiries after one has returned home. In the case of the teacher salary study, I am certain that the effort would have been more productive, and I suspect it would have been no more expensive, if it had allowed for visits to the major European education ministries. I recommend that the cost and benefit trade-offs at least be considered if similar research is undertaken by NCES in the future.

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APPENDIX: DATA ITEMS AND DATA SOURCES

This appendix identifies the specific sources of the salary data presented in this report and, where applicable, explains the methods of calculating salary figures. The entry for each country deals first with the average-salary data presented in Tables 2 and 3 and then with the salary-scale data underlying Tables 6-8.

Canada

- Average Salaries: The data are the average salaries reported for Canada as a whole (excluding Quebec, which has not reported this information) in the annual reports entitled Salaries and Qualifications of Teachers in Public Elementary and Secondary Schools, Statistics Canada, various years.

- Salary Scales: No national salary scales exist, and no entries for Canada are included in Tables 6-8.

United Kingdom

- Average Salaries: The figures in Table 2 were produced by the Statistics Branch of the Department of Education and Science. The 1982 data are from the Department's publication, Education Statistics for the United Kingdom, 1983 edition, Her Majesty's Stationery Office, London. The 1984 data are from a more detailed unpublished tabulation supplied by Mr. Brian J. Rusbridge of the Local Authorities' Conditions of Service Advisory Board (LACSAB).

- Salary Scales: The 1984 salary schedules on which the UK entries in Table 6 are based were published in Education, September 21, 1984. They were supplied by a personal acquaintance in London. Similar scales for 1982 through 1985 were supplied by LACSAB, too late for use in the study. Scales for 1982 are also included in the Three-Country Study of the Netherlands Ministry of Education and Science (Organization for Research in Management, 1983).

Netherlands

- Average Salaries: The 1982 entries in Table 2 are from the previously cited Three-Country Study. They are estimates based on the scheduled salaries of teachers with average characteristics and as such are subject to substantial error.

- Salary Scales: The 1984 salary scales underlying the entries in Table 6 were provided by Dr. T. Gloudemans of the Netherlands Ministry of Education and Science. The particular primary scale shown is for teachers with "B" certificates. The secondary

scale shown, labeled scale "3e" is at the mid-range of 11 scales, differentiated by qualifications and proficiency, according to which secondary teachers are paid. Scales for 1982, not shown in the tables, are presented in the Three-Country Study.

Federal Republic of Germany

- Average Salaries: The 1982 entries in Table 2 are from the previously cited Three-Country Study. They pertain specifically to the state of North Rhine-Westphalia. They are estimates based on the scheduled salaries of teachers with average characteristics and as such are subject to substantial error.

- Salary Scales: The 1981 salary scales on which the entries in Table 6 are based are from the Three-Country Study. The scales labeled "primary" and "secondary" are scales A12 and A14, respectively, of the federal civil service pay schedule. Teachers at each level are paid on several different scales, but the ones selected are those applicable to the largest percentages of teachers at the respective levels.

Sweden

- Average Salaries: All average salary figures were provided in a memorandum from the National Swedish Agency for Government Employers. No information is available on the original source.

- Salary Scales: The 1984 scale underlying the Table 6 entries, for teachers of grades 1-3 only, was provided in the same memorandum. On this scale, the interval between steps is 1-1/2 years, but for purposes of comparison it has been translated into one-year steps in Table 6.

Denmark

- Average Salaries: The 1982 salary averages in Table 2 are from a bulletin, "Salary Statistics for Municipal Employees, 1982" released by Danmarks Statistik, August 29, 1984.

- Salary Scales: The 1984 scale represented in Table 6, which applies to teachers of grades 1-10 was provided in a memorandum from Danmarks Laererforening, the union of teachers in the Folkeskole, which was provided by the Danish embassy.

Italy

- Average Salaries: No data available.

- o Salary Scales: The 1985 salary scales represented in Table 6 were obtained for us, apparently from a large report on civil service salaries, by the Cultural Division of the Italian Ministry of Foreign Affairs and provided as attachments to a letter from the Italian embassy in Washington. The exact source is unknown.

France

- o Average Salaries: No data available.

- o Salary Scales: Copies of French civil service salary scales, effective November 1, 1984, were provided by the cultural attache of the French embassy in Washington, along with instructions for applying the scales to various categories of teachers. However, we were not able to learn how to associate pay levels with years of seniority. Accordingly, no scales are shown in Table 6, but data on salary ranges are shown in Table 7.

Australia

- o Average Salaries: No data available

- o Salary Scales: Salary schedules by state, applicable to both primary and secondary teachers, were provided by the Australian Teachers' Federation (the national teachers' union). A scale to represent Australia as a whole was constructed by calculating weighted averages (with numbers of teachers as the weights) of the salaries offered at each step on the scale in the states of New South Wales and Victoria, which together employ about 60 percent of all Australian teachers.

New Zealand

- o Average Salaries: The 1986 figures in Table 2 were provided in a handwritten note from a visiting official of the New Zealand Department of Education. The source of the figures is unknown.

- o Salary Scales: The 1985 salary scales on which the entries in Table 6 are based are from "Education Service Salaries Chart," supplement to the Education Gazette, Wellington, New Zealand, June 14, 1985.

Japan

- Average Salaries: The average-salary figures for 1980-1984 were constructed from data published in annual reports of the Ministry of Home Affairs entitled, Actual Situations of Earnings of Non-National Government Employees, Tokyo, various dates. The calculation procedure involved (a) aggregating figures on monthly base salaries and monthly or annual amounts of bonuses and various allowances and (b) prorating to adjust for the unwanted inclusion of principals and vice-principals in some of the data. Details are given in Barro (1986).

- Salary Scales: The relative salary scales shown in Table 6 are based on scheduled monthly base salaries for 1984 for teachers with B.A. degrees, provided by the Japanese Ministry of Education, Science and Culture. Scales for 1980-83 were also provided. The 1982 scales are also published in Ministry of Education, Science and Culture, Education in Japan, 1982: A Graphic Presentation, Tokyo, 1982.

South Korea

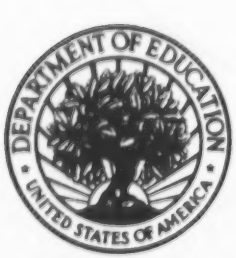
- Average Salaries: The 1984 average salary figures in Table 2 were constructed by applying scheduled salaries to the numbers of teachers at each pay grade and then adding appropriate percentages for bonuses and various allowances to the resulting base salary figures. The data on distributions of teachers by pay grade are from the Ministry of Education, Republic of Korea, Statistical Yearbook of Education, Seoul, 1985. All other data items were supplied by the Ministry of Education, Republic of Korea, in response to a request relayed through Mr. Yon-won Ryoo of the Korean embassy in Washington.

- Salary Scales: The 1984 pay scale represented in Table 6 is from a special tabulation prepared by the Ministry of Education, Republic of Korea, in response to the aforementioned request. Scales for the years 1980 through 1983 were also provided.

United States

- Average Salaries: The figures for 1980-1984 shown in Table 2 are from National Education Association, Estimates of School Statistics, various years.

- Salary Scales: The entries for the U.S. in Table 6 are from a synthesized "typical" salary scale constructed from salary-scale data for a sample of school districts provided by the American Federation of Teachers. The synthesis procedure is summarized in Section 3 of this report and described more fully in Barro (1986).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